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LIGHT - HEAT - POWER - BY-PRODUCTS

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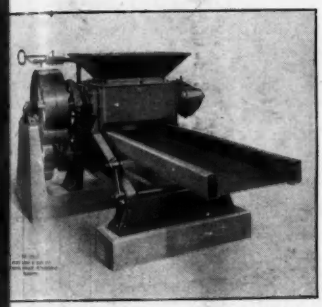
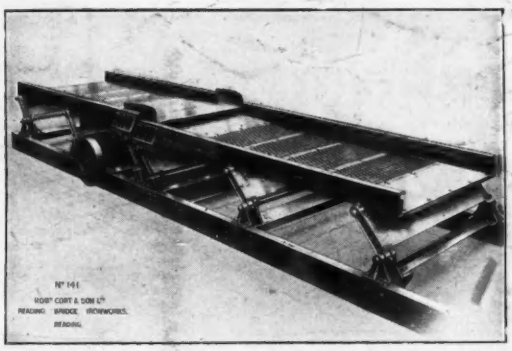


COKE CUTTING MACHINE WITH RECIPROCATING SCREEN



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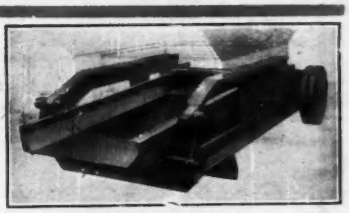
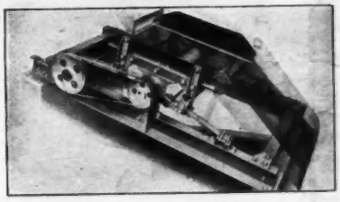
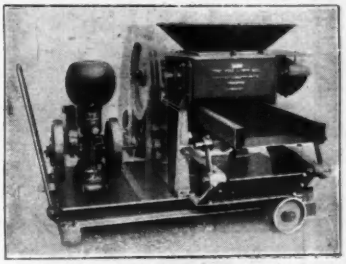


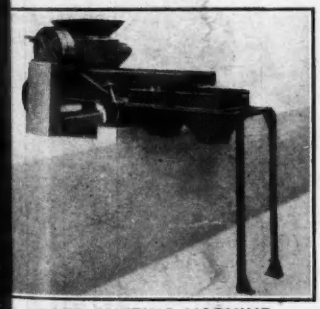
RECIPROCATING DEBREEZING SCREEN



VIBRATORY SCREEN



PORTABLE COKE CUTTING AND SCREENING UNIT



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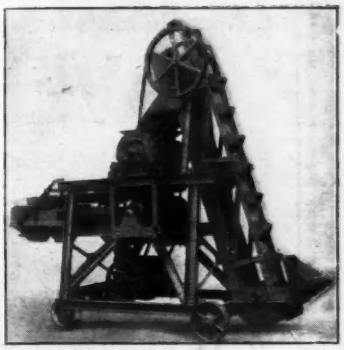

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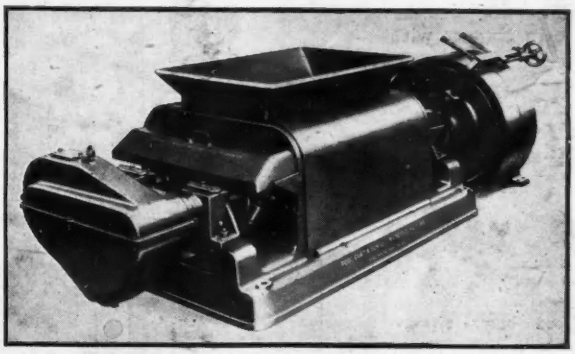

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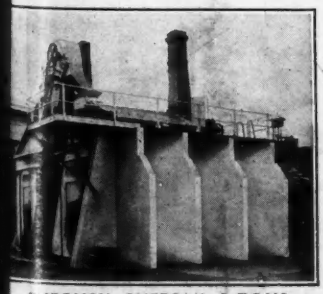

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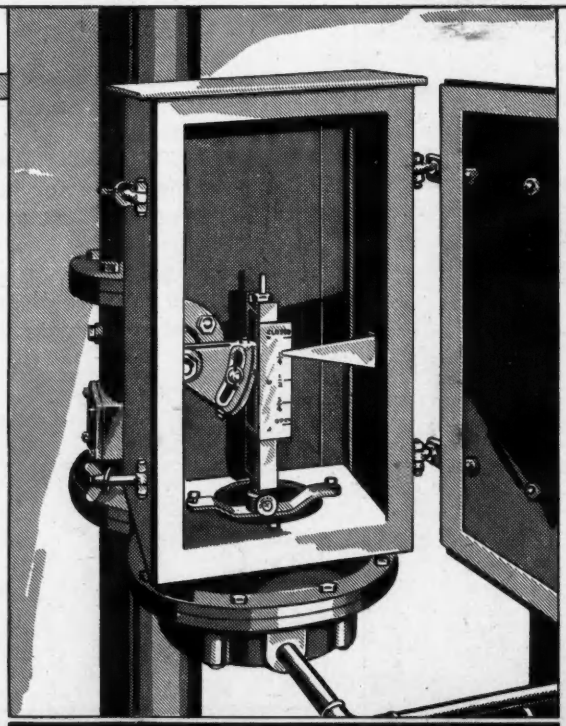

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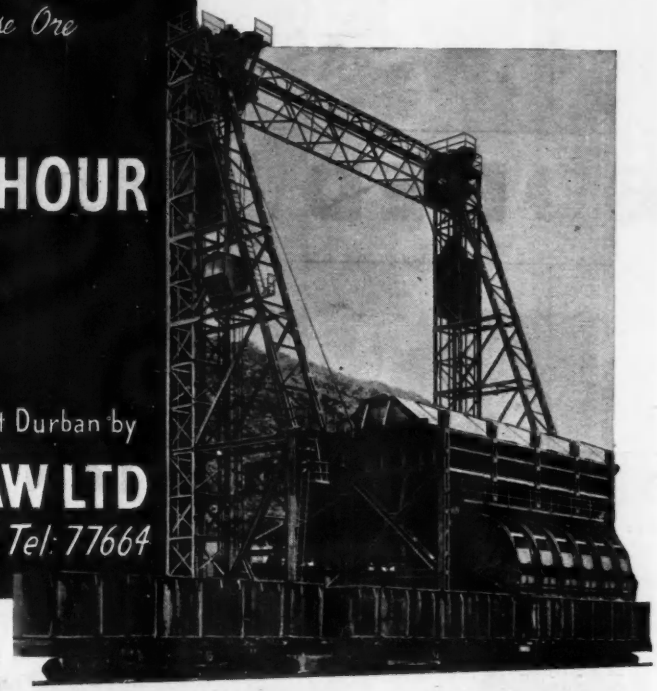

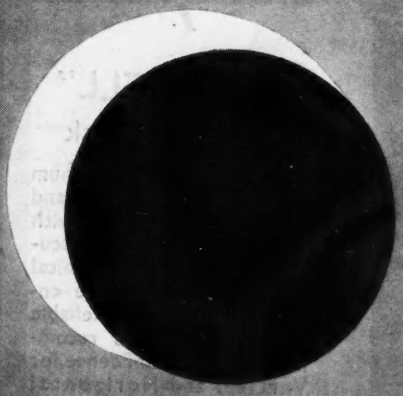

For the past six years Gas Meter work necessarily suffered a partial eclipse and first place had to be given to wartime needs. With Peace once more established the eclipse has passed and the wheels of Industry now hum a more pacific measure.

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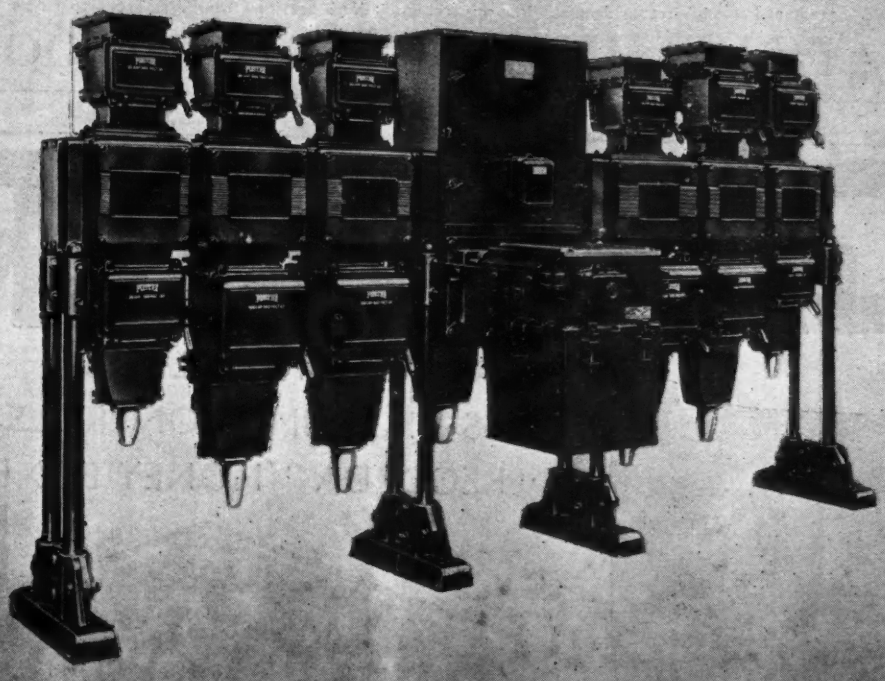

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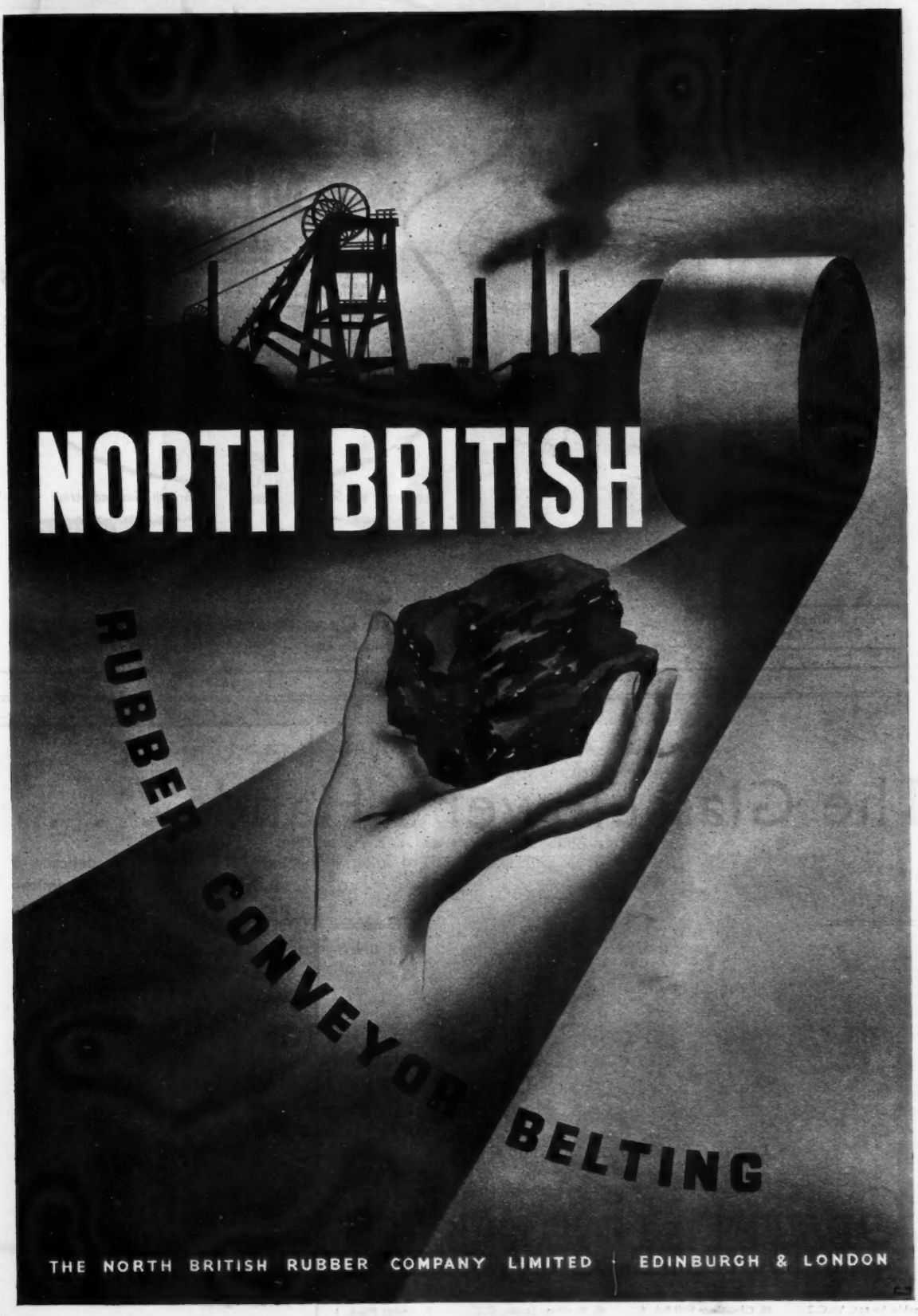
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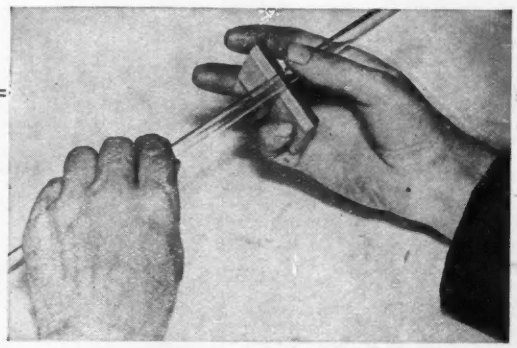

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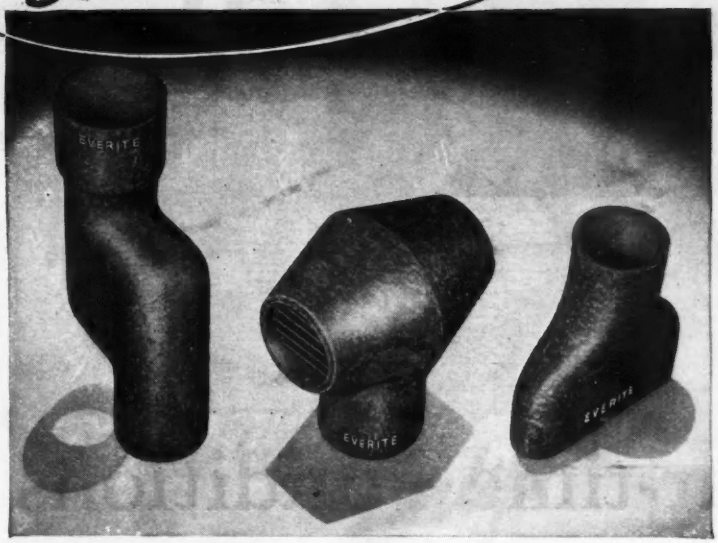

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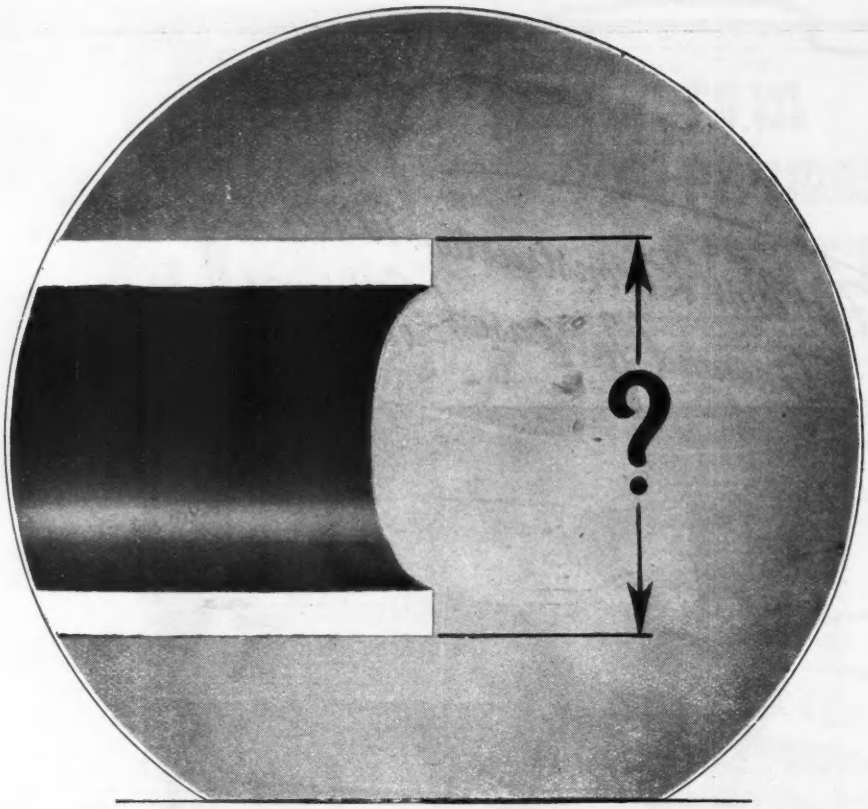

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Calorific Value of gas	**503·5** B.Th.U.
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Oil used per 1,000 cu. ft.	**2·0** gall.
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Carbon consumed in generator per 1,000 cu. ft.	**22·9** lb.

H. & G. Water-Gas Plants range in Unit Capacity from 80,000 to 9,000,000 cu. ft. Daily.

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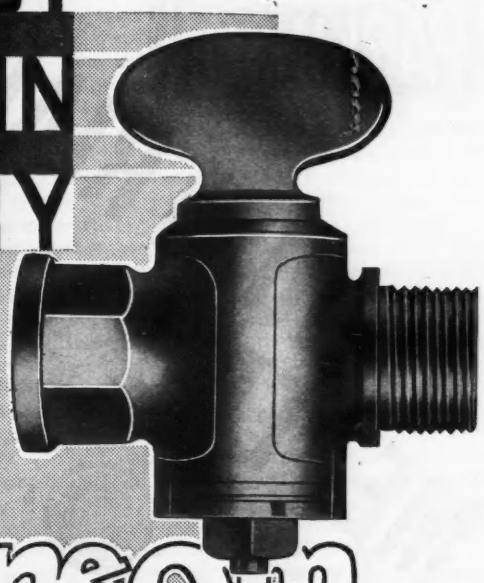
THE FOREMOST GAS COCK IN THE INDUSTRY



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THE APPLICATION OF THE SPRING LOADING to the plug is carried out in a special manner, which ensures that the plug is always retained on its bearing at a uniform pressure. Dismantling is never necessary.

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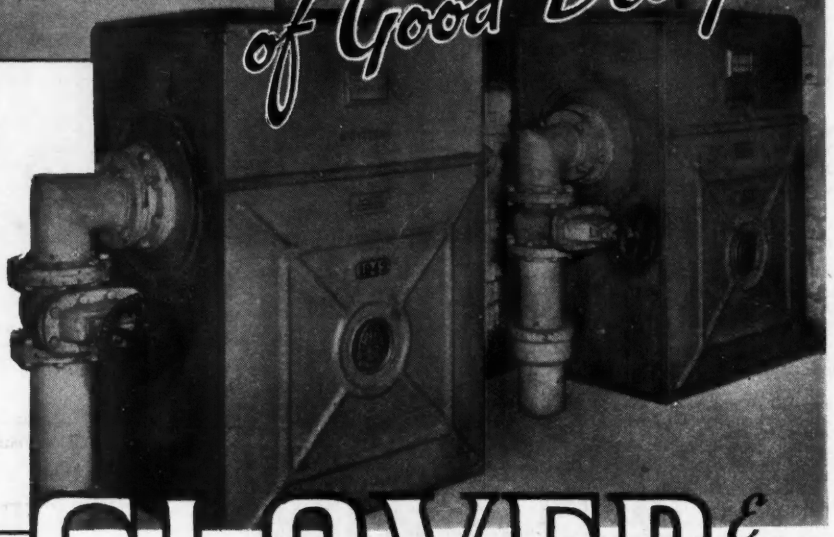

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GAS JOURNAL, OCT. 17, 1945

VOL. 246 97th YEAR No. 4300

EDITORIAL NOTES

A TWO-FUEL INDUSTRY?

THE Twelfth Annual Meeting of the London and Counties Coke Association was held on Monday last. The importance of this pioneering body cannot be over-exaggerated, and we think that its followers have invariably been gracious in their acknowledgment of the help and inspiration they have gained from it. The L.C.C.A. covers a wide area within which coke is in especially high demand—an area away from the main coalfields. The demand has been created by the positive policy of the Association, from the angles of preparation, marketing, and equitable distribution of the Gas Industry's solid smokeless fuel, the sale of which enables gas to be sold in the competitive fuel field at a reasonable price.

The faith shown in the L.C.C.A. is indicated by the simple fact that it represents 99.8% of the coke produced in its area, and it is also a simple fact that it operates in a parched rather than a saturated market. In 1939–40 the production of coke for sale was 3,847,560 tons; in 1944–45 the corresponding figure was 3,766,400 tons. Actually these statistics do not interpret demand. The coke position throughout the war has been difficult, and we go so far as to say that coke consumers have been penalized in favour of gas consumers. During the past two years there has been persistent shortage of coke. Since the beginning of the war coke prices have risen *ex* works by 30s. 3d., and as delivered by 31s. 6d. Nor is this a true picture of the consumer's discomfort. The coal supplied to gas undertakings has increased in ash content and decreased in general quality, which characteristics have inevitably been translated and intensified in the coke produced from the coal. Consumers of coke have to pay 32s. or so more a ton for a product of decreased standard—if they can get the product at all.

In the meantime gas prices have to an extent increased and pressures have been variable, but the standard of gas quality has been more or less maintained and gas has been continuously on tap. Domestic gas consumption has increased alarmingly, in spite of the poster artist and economy supplicator. There has been no rationing. There has been no rationing of coke in theory. It has not been necessary because coke consumers have been and remain at the mercy of the suppliers, and if the suppliers have been unable to deliver the coke the consumers have had empty bins. Of course we realize and well appreciate the difficulties of labour and of transport of solid fuel; and we have reason to believe that the public, too, appreciate these difficulties, and have exhibited most admirably and most remarkably patience and restraint. But surely it is a little hard on coke consumers—users of a fuel at the moment containing much ash and unreliable in supply, however limited that supply—to witness concurrently the comfort and convenience afforded and enjoyed by the user of gas, who, irrespective of exhortations on the hoardings, &c., regarding the need for fuel economy, is able to have that comfort and convenience on tap and at all times.

Expediency may have its claim, but the equity of the position is questionable. We quote from the annual report of the London and Counties Coke Association for the period ended June 30 last: "The coke position during the year has been very difficult, particularly during last winter, and the outlook for the current year is worse. The Association has done everything possible to ease the position, and has continuously placed before the Ministry of Fuel and Power the importance and the requirements of its coke consumers. This shortage was due largely to the requirement of the Ministry that gas undertakings should make the maximum use of water gas. . . ." It is pertinent to ask to what extent the Gas Industry desires to define itself as a two-fuel Industry, and how keenly it wishes to avoid discrimination between the legitimate requirements of its gas, its gas-cum-coke, and its coke consumers.

OF THINGS TO COME

THE words "current difficulties" are on the lips of most people, and they echo round the walls of council chambers in the Gas Industry, and amid counsels far more important, august, and more universal in their influence. There have been "current difficulties" for several years; without doubt there will be difficulties to come. We have with us a grave labour shortage, the while there is spasmodic laying-down of tools, in general, we think, more out of utter weariness than in any genuine cause. The war has left behind it a memory of magnificent effort and sacrifice which seems to be in peril from a cloud, a grey cloud, of boredom and incivility. Many of the dreams of those who have fought during the war years, combatants and the slowly moving queue troopers, have had their gold sadly tarnished. Many are beginning to wonder how long they will have to wait for the minor creature comforts which they thought would follow on the heels of war's end.

Turning to our own particular Industry, a small piece, but a key piece in the jig-saw of human comfort and happiness, we are often questioned whether anything is taking shape to make dream kitchens come true, if improvements in gas-consuming appliances are merely in the drawing board circle and triangle stage, or whether there are in fact solid grounds for hope. To which set of general queries we can answer without hesitation that, while there remains need for patience, there are certainly grounds for hope. We are speaking at the moment in the particular. Recently we had the privilege of inspecting in detail, without let or hindrance, the development and research work which is being actively pursued in a most practical way by the firm of De La Rue Gas Development, Ltd. As part and parcel of our own work we have seen from time to time, at close hand, a good deal of the conduct of research and development activities in the laboratories and workshops and drawing offices of private, public, and government undertakings and authorities and in the laboratories of the universities. We formed the opinion that in their own way and within their own sphere De La Rue are tackling this matter of research and development on lines destined to lead to a more interesting gas service to the public. "A more interesting gas service" implies, of course, gas appliances of raised technical performance and greater aesthetic appeal, the while operating within the bounds of the users' pockets and with the blessing and enjoying the full confidence of gas supply undertakings. In what was shown to us so openly by De La Rue a few days ago we found a source of encouragement regarding "things to come."

Personal

Mr. SYDNEY SMITH, Engineer and Manager of the Paisley Gas Department, has been appointed General Manager and Engineer of the Romford Gas Company. He went to Paisley in 1939, since when the annual make of gas had increased from 620,000,000 to 940,000,000 cu.ft., a rise of over 50%. A native of Bradford, he served in the gas department there and also in Birkenhead, Dunfermline and Bristol before going to Paisley. He is a member of the Scottish Management Committees of the National Gas Council, the B.C.G.A., the Federation of Gas Employers, and the Regional Council of the National J.I.C. He also represents Scotland on the General Executive Committee in London. A member of the Council of the North British Association of Gas Managers, he is Chairman of the Domestic Gas Advisory Committee for Scotland, and Joint Chairman of the Local Appeal Board of the Ministry of Labour and National Service.

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Mrs. CLOUDESLEY BRERETON, who was for many years in charge of the editorial activities of the British Commercial Gas Association, has just heard that of her two sons who were serving in the Far East, the elder, IAN HOROBIN, who was a prisoner, is safe and well and will be home soon. The other, MALCOLM BRERETON, Royal Norfolk Regiment, was reported missing after the fall of Singapore, and is now reported killed on Feb. 10, 1943.

* * *

The Lord President of the Council has appointed Professor H. MUNRO FOX, Professor I. M. HEILBRON, and Mr. C. C. PATERSON to be members of the Advisory Council to the Committee of the Privy Council for Scientific and Industrial Research from Oct. 1. Professor A. V. HILL, Sir FELIX POLE and Sir ROBERT ROBINSON retired from the Council on completion of their terms of office on Sept. 30.

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Professor D. T. A. TOWNEND has recently returned from a visit to the United States on an official mission. While there he visited a number of research organizations concerned with fuel and chemical engineering problems. He gave an address to the staff of the Institute of Gas Technology at Chicago, and also conveyed greetings from this country to the American Gas Association.

* * *

The Grand Council of the Federation of British Industries has accepted with great regret the resignation of Sir GUY LOCOCK as Director of the F.B.I. Sir Guy, who has occupied this position with distinction for 14 years, first joined the Federation as Assistant Director in 1918, and has agreed to continue in office until his successor is installed, and thereafter to make his services available to the Federation in an advisory capacity. The Council has approved the appointment as Director-General of Mr. N. V. KIPPING, to take effect as early in the New Year as his release from Government duties can be arranged. During the war, Mr. Kipping was head of the Regional Organization of the Ministry of Production. With the end of the war and the assumption by the Board of Trade of the continuing functions of the Ministry of Production, he was appointed an Under-Secretary of the Board of Trade and became responsible, *inter alia*, for the Regional Boards as a whole and for the Board of Trade's own regional organization. Before joining the Ministry of Production Mr. Kipping was Works Manager of Standard Telephones and Cables, Ltd.

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Captain A. R. THOMAS, having returned from military service, has resumed his position as West Country Representative of the Davis Gas Stove Company, Ltd. (Radiation Ltd.).

Sir Ben Smith, Minister of Food, opened a Food and Health Exhibition at Radiant House, Liverpool, on Oct. 1. On the extreme right of the picture is Lieut.-Col. Albert Buckley, Chairman of the Liverpool Gas Company.

Obituary

Sir David Milne-Watson

Ex-Councillor Walter Muter, of Edinburgh, a Past-President of the British Commercial Gas Association, writes: The passing of Sir David Milne-Watson leaves a gap in the ranks of the Gas Industry which will indeed be difficult to fill. A great cohesive force has departed. His gift of leadership was outstanding, and in the day-to-day work of the national organization of the Industry he brought to bear infinite persuasion, perseverance, and tact. In addition he had in a large measure that inherent quality of many Scots—"canniness." He had a wide vision of the future of the Industry, and I well recall his advice to me on joining the Committee set up some years ago to examine a new framework of organization—"Break down the Barriers that stand in the way."

The well-founded relationship and almost complete absence of industrial strife in the Industry was due in large measure to the sagacity and understanding of Sir David. I should also refer to his passionate interest in the housing and rehousing of the people. It was a great privilege to be with him on a visit to the Gas Light & Coke Company's scheme at Kensington. There the Governor was at home in the day nursery, and the slight austerity natural to most Scots vanished in the happy atmosphere. An ex-Cabinet Minister once remarked, "I see you are taking some interest in Sir David Milne-Watson's Industry." His name was synonymous with Gas.

At the present confluence of interests as represented in the British Gas Council I venture the view that the best memorial to the life and work of Sir David should be the building of that new organization on firm foundations, the eschewing of mere expediency, and the fashioning of a powerful instrument that will speak and act for the Industry in no uncertain way in the difficult days that lie ahead. Thus we can perpetuate the life and work of a great captain in our ranks.

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The death has taken place of Mr. L. F. MCLEOD, O.B.E., Distribution Engineer to the South Metropolitan Gas Company.

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The death occurred on Oct. 12 of Mr. JAMES WARRILOW, who retired in September, 1944, from the post of Works Manager of the Stoke-on-Trent Gas Department after a total of 60 years' service. For 38 years he was Assistant Engineer for the British Gas Light Company at their Etruria Works, and for the remainder of the time he was Works Manager to the Stoke-on-Trent Corporation.

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The death occurred on Sept. 22 following an operation of Mr. FRANK CLARK, Chief Clerk of the General Manager's staff of the Bath Gas Company. He was 67 years of age, and had served the Company for 48 years. Owing to the war he continued in the Company's service after reaching the retiring age in 1943.

Diary

Oct. 19.—National Smoke Abatement Society: Conference on Improved Fuel Burning Appliances for New Houses, 10 a.m., Caxton Hall, Westminster.

Oct. 20.—Manchester Juniors: Demonstration Theatre, Manchester Gas Department, 2.30 p.m. Address by A. F. Oatley, Cannon Iron Foundries, Ltd.

Oct. 23.—Southern Association of Gas Engineers and Managers (Eastern District): Committee, 11.30 a.m.; General Meeting, 2.30 p.m., Gas Industry House. Paper, "The Stability of Heated Structures," by L. Muir Wilson.

Oct. 25.—Midland Association of Gas Engineers and Managers: King Edward House, New Street, Birmingham, 2.30 p.m. Presentation by L. W. Andrew (one of the Authors) of the Institution Paper, "Technical Aspects of the Gas Industry's Contribution to Post-War Housing."

Oct. 25.—Town and Country Planning Association: Lunch-time meeting, 28, King Street, Covent Garden, W.C. 2. Talk and discussion on "Town Planning and District Heating."

Oct. 26.—Manchester District Association of Gas Engineers: Demonstration Theatre, Manchester Gas Department, 2 p.m. Paper by R. J. Bradshaw on "Use of Town Gas in the Glass Industry."

Oct. 29.—Eastern Counties Gas Engineers' and Managers' Association: Autumn Meeting, Grosvenor House, Park Lane, W. 1.

Oct. 31.—London Juniors: Visit to the coke oven plant at the Gas Light and Coke Company's Beckton Works.

Nov. 2.—London Juniors: Meeting at Gas Industry House. Paper by J. F. Waight, "Applications of 'Neat' Gas in Industry."

Nov. 12.—Women's Gas Council: Executive Committee, 12.45 p.m., Gas Industry House.

Nov. 14.—B.G.C.: Gas Industry House, 2.15 p.m.

Nov. 27–28.—Institution of Gas Engineers: Autumn Research Meeting.

Dec. 6.—Town and Country Planning Association: Lunch-time meeting, 28, King Street, Covent Garden, W.C. 2. Talk and discussion on "Heating the Family Home."

Southern Association

The Southern Association of Gas Engineers and Managers held its Annual General Meeting at Grosvenor House, Park Lane, W. 1, on Oct. 10 under the Presidency of Mr. W. A. Howie (Maidstone).

The meeting observed a brief period of silence as a mark of esteem and respect for the following members, who had died since the last meeting: Thomas Carmichael (Deputy Chairman and Managing Director, Portsmouth and Gosport Gas Company); Sir David Milne-Watson, Bart. (late Governor, Gas Light & Coke Company), an Hon. Member of the Association since 1927; W. W. Hammond (Bognor); L. F. McLeod (South Metropolitan Gas Company).

The President, in a tribute to Sir David, said the Gas Light & Coke Company in particular, the Gas Industry in general, and the Association, had lost a great leader. Sir David had passed away peacefully at his home in Dorset a week ago. Mr. Thomas Carmichael was another outstanding personality in the Gas Industry. "Tom," as he was affectionately known, was beloved by all, particularly by his staff and other employees.

The Hon. Secretary and Treasurer (Mr. J. M. Webber) presented the accounts for the six months from January to June, 1945 (the Association having altered the date of the end of its business year from December to June). He mentioned that for a number of years the donation to the Benevolent Fund of the Institution of Gas Engineers had been 30 guineas per year; but the Committee had decided to increase it to 50 guineas.

On the motion of Mr. Frank Dawson (Vice-President), seconded by Mr. P. E. Browne (Brighton), the accounts were adopted.

An addendum to the Annual Report, covering the period from January to June, 1945, together with the Annual Report for 1944, were presented for discussion.

On the motion of Mr. G. L. Braidwood (Gas Light & Coke Company), seconded by Mr. Noel S. Smith (Bristol), the reports covering the period of 18 months were adopted, without discussion.

The following new members were elected, as recommended by the Committee: Alfred W. Barnett (Assistant Engineer and Works Manager, Snodland); Charles Bateman (Engineer and General Manager, Bath); Reginald Baker (Senior Assistant Engineer, Gas Light & Coke Company, Beckton); Horace A. Probin (General Manager, South Eastern Gas Corporation, Ltd.); Harold Simmonds (District Manager, Eastbourne Gas Company).

The President made a token presentation, on behalf of the members, to Mr. R. C. Taylor, M.B.E. (Torquay), in appreciation of his services as President for a period of 18 months (he having kindly accepted office for the further period of six months from January to June, 1945). It was recalled that he had been in office when peace in Europe was declared; and Mr. Howie expressed his own pleasure in having been in office when the war against Japan had ended. In spite of the many difficulties created by the war, Mr. Taylor had enjoyed a most successful and happy period of office, and his many friends in the Western District had given him their full support. At the meeting of the Association in March, 1944, Dr. Evans had given an inspiring Address; at the autumn meeting the Association was fortunate in having a Paper by Dr. Dent, on the hydrogenation of coal; and at the May meeting, 1945, Mr. Sylvester had delivered an Address on costs and charges in the Gas Industry. Mr. Howie said how glad he was to have the honour to present to Mr. Taylor in token a memento of his successful year of office.

Mr. Taylor, who was heartily applauded, said his Presidential year was an honour which he had greatly appreciated and valued, and he would always retain his memento of it with deep pride. Without in any way depreciating the work of future Presidents, he said that the real work of the Association came from the Committee and the Hon. Secretary and Treasurer; he expressed his gratitude for the fine backing they had given him. All the members were aware of the grand work which Mr. Howie had done as Hon. Secretary for a number of years, and Mr. Taylor was pleased to pay tribute to it again. Mr. Webber, who had succeeded Mr. Howie during 1944, was no mean successor, and with the Hon. Secretaryship in such hands one need have no worries as to the progress of the Association in the future. Mr. Taylor took the opportunity also to express thanks to the Technical Press.

Presidential Address

Mr. Howie then gave his Presidential Address—see p. 535.

Mr. G. Le B. Diamond (Past-President, Reigonal Controller, South-Eastern Region No. 12) proposed thanks of the Association to the President for his Address. The members wished to express their pleasure in seeing Mr. Howie in the Presidential Chair; he had given generous and devoted service for a long term of years, and they were grateful for the immense anount of time he had given to the affairs of the Industry. One could recall that some 20 and more years ago he was a regular attendant at the meetings of the Association, and had taken the keenest interest in its work long before he had accepted the onerous duties of Hon. Secretary. As a Coal Spokesman he had had to grapple with a thankless task. While he had not always been able to meet the desires and wishes of engineers temporarily placed in a sorry position in the matter of coal stocks, he had done everything except wave a wand, and would have done that if he could have found the right one. As the main theme of his Address he had dealt with the troubles in the coal industry and their effect—together with the problems of increased wages and heavy taxation. Speaking as one who had been in close contact during the war years with the mining industry and had seen and had been involved, at first hand, with some of the grievous problems with which it was faced, Mr. Diamond said the President had in one sentence put his finger on one of the reasons which had contributed more than almost any other to the difficulties of to-day; it was in the statement that when he was at South Shields he had purchased coal at 8s. 6d. per ton f.o.r. the gas-works. In those violently competitive days coal was too cheap, and there were insufficient resources at the disposal of the colliery owners with which to remunerate the miners and to provide the amenities they should have had. To some extent that would, no doubt, be responsible for the bitterness between both sides which had come down through the years. That might have had a bearing also on the major problem of the decline in man-power and the reluctance of new recruits to come forward for coal mining. He believed there would have been a coal crisis anyhow, even if the war had not precipitated it; they were leading up to the position produced by declining man-power in the pits and the approach to the end of the coal age. The experts had advised that the only solution to the problem lay in the use of mechanical plant wherever it could be installed, and the utmost economy in the employment of existing labour. In the Reid Report, to which the President had referred, those matters were dealt with in a masterly fashion, and Mr. Diamond recommended all who had not yet done so to read that most interesting document.

The Gas Industry's own labour difficulties had rightly formed the subject of review; and what a problem it was! The withdrawal of the Ministry of Labour powers of direction had more or less thrown the Gas Industry on to the open labour market at a most unpropitious time, when there was an immense amount of employment available of a more congenial and less arduous nature. There could be little doubt that the Industry would have to tackle that urgent problem by providing a higher standard of working conditions for its employees, such as, for example, (*a*) the provision of a six-shift week; (*b*) the installation of dust extraction plant; (*c*) the provision of bathing and washing accommodation on a much more generous scale.

Mr. J. H. Dyde (Uxbridge), seconding, recalled the President's remark, in the early part of his Address, that he would endeavour to give a year of service to his fellow members with a view to "enjoying" a programme of personal contacts, and opportunity of renewing many acquaintances and also making new friendships. How well, he commented, that remark summed up the President's genial personality, and much of his simple philosophy of life. One sensed the main Rotary principle in his ideal of service. It had been said by Dr. Johnson that example was always more efficacious than precept; and one could be sure Mr. Howie would accept in the right way the remark that the way he had shown by example what should be done was of even greater value than perhaps some of his conjectural statements with regard to the future.

The President, in his response, said that his main theme was that they knew to a certain extent that for the next two or three years they were really up against it. Conditions were not at all delightful from many points of view, and if engineers would consider seriously any matter connected with their works which would bring about a real reduction in the selling price of gas, they would be proceeding on the right lines.

Cambridge Instrument Jubilee

Registered as a limited company in 1895, although it had existed as a private company for 17 or 18 years earlier, the Cambridge Instrument Company, Ltd., has lately celebrated its Jubilee, and to mark the occasion has published a brochure entitled "Fifty Years of Scientific Instrument Making." Published since the end of the war in Europe, but before final victory, the history is more modest than it could well have been had it been possible to include some account of the Company's wartime achievements.

The scientific instrument industry has developed rapidly in the last 50 years, and the brochure gives some interesting glimpses of the scientists who have contributed to that progress, and the many and varied ways in which the Company has provided industry with the means for controlling, recording, and interpreting processes and conditions in the laboratory and in full scale operations.

In the war the firm again became a controlled establishment, and in addition to the production of standard industrial equipment was engaged on much work of a confidential character. The welfare of employees was not neglected. Canteens inaugurated in the previous war were maintained, and spacious accommodation was provided for meals and social activities. A bonus scheme calculated on the net trading profits for each year has been in existence since 1924. At the same time a benefit fund was inaugurated to provide for exceptional expenditure and hardship, especially of a medical character. A contributory pension scheme was introduced in 1927. Of the 800 people employed at the outbreak of war, 126 have received certificates for 25 years' service, and most of them are still in the Company's service.

British Gas Council

A Meeting of the British Gas Council was held at Gas Industry House on Oct. 9. Mr. A. E. Sylvester, F.C.A., presided.

Before the normal business started, the Chairman said he had the sad duty of placing on record, with due solemnity, the passing of one who in his generation had been the great leader of the Gas Industry, Sir David Milne-Watson. There was nothing more certain than that he had died in the assurance of the great regard and affection of the Gas Industry as a whole. Mr. Frank Jones referred in affectionate terms to his long association with Sir David, and Mr. C. S. Shapley spoke in appreciation of him.

It was stated that since the last meeting of the Council the Ministry of Fuel and Power had accepted the decision of the Co-ordinating Committee of the Gas Engineering Advisory Boards that it was impracticable to suggest that if a reduction of pressure were necessary in the case of certain gas undertakings, a similar reduction should be made by all undertakings in the Region, whether they were affected by shortage of coal supplies or not, and that no such undertaking should be thereby penalized.

The resignation was reported of Mr. Wesley Whimster, of Bath, who had been an elected representative member of the Bath Gas Company on the National Gas Council since 1918, and was appointed a member of the Central Executive Board in April, 1944. It was agreed that a letter be sent to Mr. Whimster on behalf of the British Gas Council, thanking him for his services and wishing him happiness in his retirement. The election was announced by the Institution of Gas Engineers of Mr. G. C. Pearson, of Birmingham, in place of Sir Frederick J. West, K.B.E., as a member of the Central Executive Board of the National Gas Council.

A report from the Executive Board of the B.G.C. was received and adopted. The report included recommendations for the reorganization of the national bodies, and stated that the following representatives had been elected to the Gas Advisory Committee: Colonel W. Moncrieff Carr; E. Crowther; Dr. E. V. Evans; Colonel H. C. Smith; and S. E. Whitehead. The report also suggested that Mr. L. F. Stemp, Legal Adviser to the Council, should be asked to prepare a Draft Constitution of the B.G.F. It was recommended that a Committee, consisting of the existing Committee, excluding the representatives of the manufacturers and contractors, together with a representative nominated by each of the Districts, should be set up as a temporary measure to deal with the important questions covered by the Terms of Reference to the Domestic Development Committee.

It was recommended that a meeting of representatives of the Council who were members of the Executive Board of the British Tar Confederation be called to consider the various views put forward in the Interim Report of the Committee, and to formulate a policy for adoption by the Council.

A letter from the Economic Division, Allied Control Division for Germany, dated Sept. 12, invited the Council to appoint a representative to serve on the Consultative Panel. It was recommended that Dr. E. V. Evans, who represented the Gas Research Board on the Panel, should also act as the representative of the British Gas Council.

Reports from the Domestic Development Committee and the Publicity Committee were passed to the Council for approval. It was suggested that any member wishing to refer to items in these reports should do so at the next meeting of the Council.

It was reported that the Director of Fuel Efficiency of the Ministry of Fuel and Power was recommending the bringing into use of producer gas plants in factories. The Executive Board felt that this instruction was ill-advised, and that the Ministry should be approached thereon.

It was reported that the Meteorological Office had discussed with the B.B.C. the possibility of broadcasting weather forecasts to gas undertakings instead of their being sent out by the Meteorological Office. A conference had taken place with the bodies concerned, at which a technical representative of the Council had been present, with the result that it was not proposed to discontinue the present system of "Gasco" warnings which are now sent to some 50 gas undertakings, and an opportunity was given to the Council to extend the list of participants.

The date of the next meeting of the B.G.C. was fixed for Nov. 14.

The Engineering Industries Association, representing more than 2,000 firms in all parts of the country, have sent a strong protest to the Government against the call-up of tool makers and other young technicians needed for the re-equipment of industry and who cannot be replaced. The memorandum says:

"It is clear that the Government are applying without discrimination a call-up formula which will place a stranglehold on the efforts of the engineering industry to reconvert to civil production. There has been no recognition of the fact that the other main industries of the country are in large measure dependent on the engineering industry in order to re-equip for the new production. No industry can be got going again effectively and efficiently until an urgent process of re-tooling has taken place, and it is this process which is being so severely retarded by the present policy, with the widespread uncertainty and apprehension among engineering firms."

West's War Service

The story may now be told of how West's Gas Improvement Co., Ltd., contributed to Britain's war effort, not only in its own specialized field of carbonizing plant, but in the production of direct war equipment. It was natural, in view of the Company's record in the first Great War, that tanks should be the principal item in their war programme, and an invitation from the Ministry of Supply to undertake the assembly of Crusader tanks was immediately accepted. To the Admiralty several thousands of mine sinkers were supplied, together with hundreds of buoys, a large number of shell racks and other details. Hundreds of buoys were supplied to the Air Ministry, mainly for mooring purposes, and a number of gas lighting buoys were included. The tank programme was carried out in collaboration with Nuffield Mechanizations, Ltd., as parent firm, and many associated firms as sub-contractors, and included the complete assembly of hundreds of Crusaders and later, Centaurs. Some of these were subsequently remodelled as bulldozers and for other purposes, and portions of the flail, or crab, anti-mine equipment were also entrusted to West's. Other appliances supplied included gun shields and mountings, oil vessels, forgings and component parts for Bailey bridges, invasion craft and other purposes.

A contract more in line with the Gas Industry was that for adapting the Glover-West vertical retort plant at Rochdale for the production of activated carbon from Sutcliffe Speakman's pure coal briquettes, together with modifications of the coal and coke handling plant to enable it to handle the briquettes with the minimum of breakage and to handle and screen the carbonized product.

During the "peak" the personnel was practically trebled, and as far as practicable the original staff were employed on their own Gas Industry work and a new staff was superimposed upon the organization to deal with war work. Increased industrial gas consumption called for many extensions of carbonizing plant, all of which were subject to the control of the Ministry of Fuel and Power, which limited its approval to the minimum. Consequently maintenance of existing plant reached, particularly towards the end of the period, dimensions much in excess of the normal.

When the war began, installations were in process of erection at Bedford, Blackpool, Bideford, Chorley, Londonderry, and Liverpool, and all, except Blackpool, which was not brought into operation until July, 1940, were completed within the first wartime winter. New installations were completed during 1940 at Airdrie, Chard, Johnstone, Hawick, Bilston, and West Bromwich, and an extension at Motherwell was completed in January, 1941. Important installations at Slough and Coventry were started early in 1940, and the Slough retorts were making gas in August, 1941, but air raid damage impeded the completion of the Coventry plant, which was not finally in commission until October, 1942. The year 1942 saw the erection of additional plant at Stoke-on-Trent, Manchester (Rochdale Road), Uddingston, a second extension at Londonderry, a new bench of retorts at York, and additions at Willenhall.

In January, 1943, a reconstruction of the 1926 retort house at the Fulham works of the Gas Light and Coke Company was brought into commission, and in the early part of the year other installations were completed at Fleetwood, Stafford, Stratford-on-Avon, and Wellingborough, and with the addition of sixteen 50-in. retorts to the retort bench at Rochdale Road, Manchester, completed in June, the 1942–43 winter programme came to an end. In the autumn an installation of 32 50-in. retorts with balanced heating was completed at St. Helens, the fifth installation of continuous verticals at this the birthplace of the Glover-West vertical retort, where the first installation made gas in 1908. Later in the year further contracts were completed at Romford and Llanelly.

Last year opened with the completion of the first reconstructed bench at the Nine Elms works of the Gas Light and Coke Company in May, and by November the whole retort house containing 116 40-in. retorts arranged in settings of the balanced heating type was in commission. Before the autumn extensions had been completed at Bury, Perth, Leigh, and Derby, and a further expension at Llanelly. November saw the completion of the interesting new installation at High Wycombe which we described a few weeks ago, and in the same month a third addition was made at Lea Bridge. A seventh plant at Leicester and a third extension at Londonderry were brought into operation early this year, and in August a further extension at Belfast was completed.

Altogether 805 new retorts, reckoning only those in new installations or completely reconstructed settings, were built and brought into use during the war in Europe, in addition to which 172 new retorts were installed abroad. During the war years approximately 4,370 retorts of all sizes were reset.

Milford Haven U.D.C. (Pembrokeshire) plans to build 775 houses, of which 103 will be Arcon temporary bungalows. Both gas and electricity undertakings are owned by the Council, who have decided that all houses on three sites (61 in all) shall have gas cookers, wash boilers, and refrigerators, the remaining 42 to be all-electric. The Gas Department's serious labour position has been aggravated by shortage of housing accommodation, but as six of these two-bedroom bungalows have been allocated and conveniently sited for the Gas Department, it is hoped to attract first-class men to this 70 million works.

Manufacture of Reactive Coke

The following replies have been made by the Authors to the discussion on their Paper "Factors Affecting the Manufacture of Reactive Coke at Gas-Works" to the Institution of Gas Engineers—see "JOURNAL" of July 25 and Aug. 8.

Mr. **H. D. Greenwood** and Dr. **J. G. King** wrote: The particular value of the Paper now lies in the lead given towards the manufacture of coke of greater reactivity than normal gas coke, and therefore of wider applicability and greater flexibility in use. This implication has been remarked upon by all the participants in the discussion, although each has expressed his own views. Dr. Parker has referred to the value of the work of the Fuel Research Coal Survey. Without the knowledge obtained by this Survey, a free choice of suitable coal would not have been possible, and it has been clearly demonstrated that choice of coal is an important consideration.

The important issue is, for the Gas Industry, the manufacture of reactive coke, particularly for domestic application. Mr. Bamber has dealt with this point in showing the possibility of producing a reactive coke by processes of normal gas manufacture. The Authors agree entirely with his statement of the general advantages of a more reactive coke in postulating a less close size grading, and providing a fire from which visible flames give more pleasing appearance. His experience of the domestic use of these more reactive cokes is a valuable lead.

Dr. Eaton agrees regarding the effect of reactivity in allowing a wider variation of size, and therefore avoiding some of the loss which would be caused by cutting large coke. The Authors agree with him that the C.A.B. value is not entirely applicable in the valuation of open grate fuel; it is only a general indication of greater or lesser activity. If sodium carbonate is to be used for the activation of fuel it will undoubtedly improve reactivity, but will have an effect upon an open fire in which the appearance deteriorates as combustion proceeds. There is at the moment, no indication of a means of overcoming this difficulty. As Dr. Eaton says, it applies even when as little as 0·5% of alkali is added. The difficulty does not, however, apply to domestic fuels which are burned in closed stoves, and in this case the important effect of alkali-activation upon ease of ignition is a factor which is worth striving for.

The Authors have indicated that they feel that improvements in the reactivity of coke should not be limited to the treatment of coke by activating agents, but should start in the carbonizing stage. This appears to be the opinion also of the participants in the discussion. In this preliminary treatment the first and obvious procedure is the careful selection of coal and the modification of carbonizing conditions. No doubt, with the lead which has been given, other methods will be found which may, in the long run, obviate the necessity for after-treatment of non-reactive coke. If a more exact explanation could be found of the fundamental reason for the variation in reactivity of coke, further research would be expedited. In this connexion a close watch should be kept on the fundamental researches of Professor Riley. His work has already given us some insight into the problem, but the full explanation of the phenomena of reactivity is still missing.

Mr. **T. F. E. Rhead** and Mr. **E. T. Pickering** wrote: With regard to the future of reactive cokes (whether naturally so or by alkali activation) for domestic appliances, particularly open grate, there seems some division of opinion as to how far such cokes are necessary or desirable. It is true that some appliances will give a higher radiation efficiency on less reactive coke, but this is rarely the predominating factor in choice of appliance, and we are sure that people who have used fairly reactive cokes (say, 0.045 to 0.050 C.A.B.), particularly if of low ash content, greatly prefer such coke.

We regard the labour-saving properties of the coke appliance as one of its chief virtues; the fuel is clean to handle, no breaking is required, no wood chopping or laying of wood and paper, and no chimney sweeping with its attendant mess and nuisance. Admittedly some of the advantages are due to gas ignition, which can, of course, be applied to other grates and fuels, but now makers have a further labour-saving device—the magazine continuously-fed open fire, a system in which one cannot use coal. The full advantage of such designs will only be obtained if a low rate of burning can be achieved with a grate operating under slow burning conditions, and here a reactive coke should prove invaluable.

As to whether we should endeavour to make appliances to burn any coke or make the coke suitable for any grate, we think perhaps both should go forward, the appliance makers chiefly working on the former (along the lines of "desirable features," specified by the Solid Smokeless Fuels Federation), and the Gas Industry should give all the support possible, while as a longer term policy the Industry should initiate research and development on the latter. Mr. Bamber remarks that the gas poker for the gas-igniting burner offers only a partial solution of the problem. We take it that he means that notwithstanding the efficiency of gas pokers and burners, coke of poor combustibility still presents a problem. We trust that Mr. Bamber's remarks about ash content will not be read as meaning that 12% ash is in any way a satisfactorily low figure. It is true, of course, that 1% of ash in the form of bat may be considerably worse than 1% in disseminated form, but surely if coke is to be a first-class fuel the figure to aim at is half this.

In pre-war days our own ash content (domestic size) was less than 6%. Dr. Eaton feels that there is little advantage to be obtained by decreasing the C.A.B. below 0.060 using properly designed coke grates. Cokes with lower C.A.B. values, however, do help very considerably in ease of ignition and flexibility.

As regards the relationship between the rate of "burning-up" of the fire and the C.A.B. value, we have graphed our times to one hundred units of "cheerful fire radiation" (a wood ignition—well grate—W.D. coke) against C.A.B., and have found a very general connexion as follows:

Time to reach 100 units.	C.A.B. value.
24	0.035 to 0.046
30	0.043 „ 0.051
40	0.047 „ 0.054
50	0.055 „ 0.065.

The slope of this curve indicates 10 min. for an 0.008 difference in C.A.B. value, but the variations of time with any one C.A.B. value are of similar magnitude.

Wages of Gas Workers

At a meeting of the Special Committee of the National Joint Industrial Council for the Gas Industry, held in London on Oct. 10, consideration was given to an application made by the Trade Union side for an increase in wages. After lengthy negotiations the Committee unanimously recommended that an increase in wages should be granted. The precise recommendations will be submitted to the meeting of the full National Joint Industrial Council to be held on Oct. 18 for consideration and approval.

Demonstration Houses

Demonstration pairs of houses, built from plans selected in the national competition organized by the House-Building Industries' Standing Committee, are now in course of building at Oadby, near Leicester; Eastcote; Ardingley, Sussex; Wilmslow and Sale Moor, near Manchester; Wakefield; Walsall and Norwich.

These houses will show what the building industry will provide in the new smaller type house as a result of the enormous amount of research work which has been devoted to the raising of the standards of insulation, plumbing and general planning. When completed these houses will be open to public viewing and criticism. They are architect-designed and will be built by members of the National Federation of Registered House-Builders, membership of which automatically binds the builder to have each house examined by an independent authority five times during construction, and ensures that should any defect occur in the house within two years of completion, it is made good without charge to the purchaser.

Other pairs of demonstration houses will shortly be commenced in 22 other areas.

The Deferred Market

In an Address recently to the Scottish (Western District) Gas Salesmen's Circle, Mr. R. J. Gregg, Sales Manager of Ascot Gas Water Heaters, Ltd., said that the deferred market was a prospect of colossal dimensions. He suggested a post-war building programme of 5,000,000 houses within the next 10 years. "Assume," he said, "the average value of a house at £1,000, plus fittings and furniture at £500, and you have 7,500 million pounds of business in prospect. A modest commission basis of 5% would amount to 375 million pounds, most of which must be paid out to salesmen well within the next decade. So far as we are immediately interested as members of the Gas Industry, it is difficult to estimate precisely what proportion of this turnover can be secured for gas appliances, but it could hardly be less than £350,000,000, of which some £20,000,000 represents the legitimate earnings of the sales organization of the Gas Industry. The Gas Industry is a component part of world industry, which desperately needs first-class salesmen, who should be well paid for honest endeavour and doubly so for real achievement.

"I have argued the pros and cons of commission on appliances for many years, and there is much to be said in its favour if only by virtue of the figures already quoted, but how much more has yet to be said for payment of commission on the sale of the product which is our primary concern—gas consumption? I am confident that before long we shall see a sales policy which has the logical increase of gas consumption as the salesmen's primary concern."

The Midland Association of Gas Engineers and Managers will meet at the offices of the Midland Counties Coke Association, King Edward House, New Street, Birmingham, at 2.30 p.m. on Oct. 25, when the Paper on "Technical Aspects of the Gas Industry's Contribution to Post-War Housing," by L. W. Andrew, E. W. B. Dunning, and G. C. Holliday, which was presented at the Institution meeting in June, will be introduced by Mr. Andrew for informal discussion.

Mr. G. C. Holliday, one of the three Authors, will present a résumé of the Paper on "Technical Aspects of the Gas Industry's Contribution to Post-War Housing," one of the principal contributions to the annual meeting of the Institution of Gas Engineers in June, at the meeting of the Eastern Counties Gas Engineers' and Managers' Association to be held at Grosvenor House, Park Lane, London, W., at 1.45 p.m. on Oct. 29.

Damage to Vegetation due to Coal Gas Leakage Through Soil*

A Method of Detecting Past Contact of the Soil with Gas

Those responsible for the distribution system of gas undertakings are from time to time faced with claims for damage to trees, shrubs, &c., alleged to be due to "poisoning" by coal gas leaking from pipes buried in the nearby soil. Occasionally the evidence as to the presence of gas is irrefutable, but in a considerable proportion of cases it is far from convincing. For example, the damage may be a fair distance from a pipe, and the only evidence that gas has diffused thus far is the claimant's statement to have smelt it; or the earth may have possessed a strong natural odour easily mistaken for that of gas by an inexperienced person. When dealing with doubtful claims like these the gas concern needs a method of establishing with certainty whether the soil has or has not been exposed to coal gas, and the test described here is an attempt to provide such a method. The test has had only a limited amount of use, as these complaints are very infrequent, but as far as our own experience goes we feel that the method is sufficiently sensitive and specific to give a decisive result in the majority of cases.

Soil in contact with coal gas absorbs some of the condensible constituents from the gas, and certain bodies among these, if present in sufficient concentration, will impart a "gassy" odour to the soil. Evidence based on odour alone may be unreliable, and the chemical tests for the odoriferous bodies are insensitive and therefore useless to detect the small amounts in question. The condensible constituents may, however, contain compounds which are readily detectable by delicate and characteristic chemical tests. The hydrocarbons, benzene and toluene, occur in coal gas, and minute quantities of these may be detected by the colour test referred to later, which is adapted from that described in the U.S. Bureau of Mines Report, No. 3287, 1935. As little as one-tenth of a milligramme of benzene yields a strong colour reaction, and this weight represents the average amount contained in about one-thousandth of a cubic foot of unwashed coal gas, or in about one-thousandth of a cubic foot of debenzolized gas.

After treatment to recover the condensible hydrocarbons, coal gas still retains a small proportion of the benzene originally present, and it has been shown experimentally that soil in contact with such gas will absorb sufficient benzene to give strong colour reactions in the test. Commercial benzole recovery is never likely to be so complete as to prevent the gas yielding a positive reaction.

Benzene and toluene are particularly suitable as indicators for the presence of gas, inasmuch as they are essentially products of carbonization, do not occur naturally in soil or vegetation, and are unlikely to reach the soil from sources other than gas except perhaps by the spillage of motor spirit. If these compounds are detected in sub-soil near to a buried gaspipe it may be reasonably inferred that gas has been leaking through the soil.

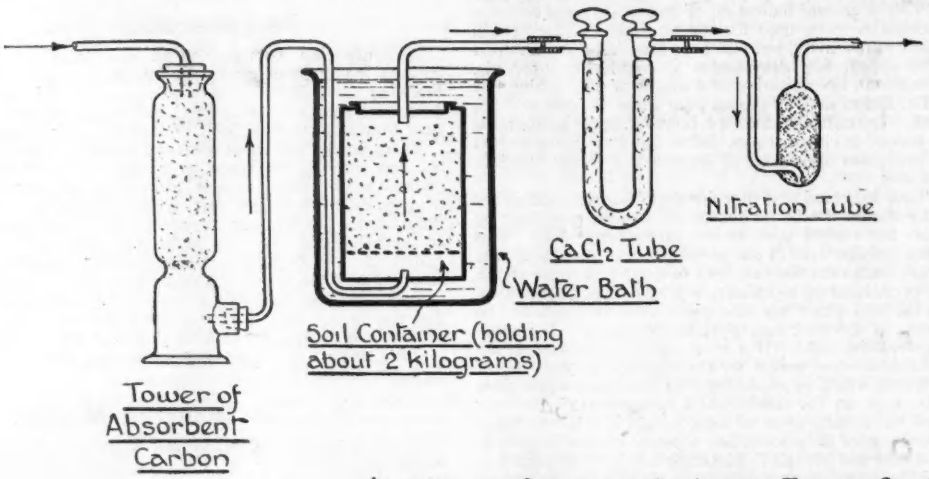
Method.

The soil is warmed to vaporize any benzene, which is carried by a current of air through a drying medium into a nitrating mixture, where it is converted into m-dinitro benzene. The amount of the latter is determined from the intensity of the violet colour formed when it is dissolved in butanone and shaken with concentrated potash solution.

Apparatus.

The soil container may be a large flask (1½ litres capacity), or better, a metal box with an airtight lid holding 3 to 4 lb. of soil, which rests on a grid about 1 in. from the bottom of the box. The soil container is heated in a water bath. A current of air* passes through the soil, entering underneath the grid, and on leaving the box passes through calcium chloride contained in a large glass-stoppered U-tube or tower. The dried air containing any benzene evolved from the soil then passes through the nitration tube, a tube of about 15 ml. capacity with inlet at the bottom and outlet at the top, packed with glass beads.

N.B.—Indiarubber should not be used in contact with air as it may absorb any traces of benzene present. Bungs are inadmissible, and where rubber tubing is unavoidable for jointing glass tubes, the ends of the latter should be cut true and touch inside the rubber sleeve.



APPARATUS FOR DETECTION OF GAS LEAKAGE THROUGH SOIL

Reagents.

(1) Nitration mixture: Add 5 ml. fuming nitric acid to 4 ml. water; cool and then add (cautiously) 25 ml. sulphuric acid (97–98%; S.G. 1.84).

(2) Caustic potash solution: Dissolve 5.5 gm. caustic potash in 4.5 ml. water, stand overnight and decant from deposited crystals.

(3) Butanone.

(4) Ammonia solution (0.880).

Procedure.

The soil container is loosely packed with the soil to be tested, any lumps being quickly broken up to facilitate vaporization of the benzene; undue exposure of the soil to air prior to the test should be avoided. The nitration tube is charged with sufficient nitrating acid to wet the beads and just seal the inlet tube. About 3 ml. is sufficient.

The water bath is maintained at about 60° C., and a gentle current of air (about 2 bubbles per second) is passed through the apparatus. At the end of an hour the acid in the nitration tube is transferred to a small stoppered separating funnel and the tube washed out with water, taking care to keep the volume as small as possible (below about 25 ml.). The acid is cautiously neutralized by adding ammonia solution from a dropping bottle until the liquid is just neutral to litmus, and one drop excess is added. The liquid is then extracted with three successive (9 ml.) portions of butanone, the extracts being collected in a small stoppered bottle and partially dried by shaking for a few minutes with a piece of granular calcium chloride. The butanone is decanted into a dry boiling tube and shaken vigorously with two or three drops of the potash solution; if benzene was present in the soil a purple colour will develop.

* A communication from the South Metropolitan Gas Company Chemical Department, Sept. 26.

* If there is any possibility that the air has already been contaminated with hydrocarbon vapours, a carbon filter should be used for purification.

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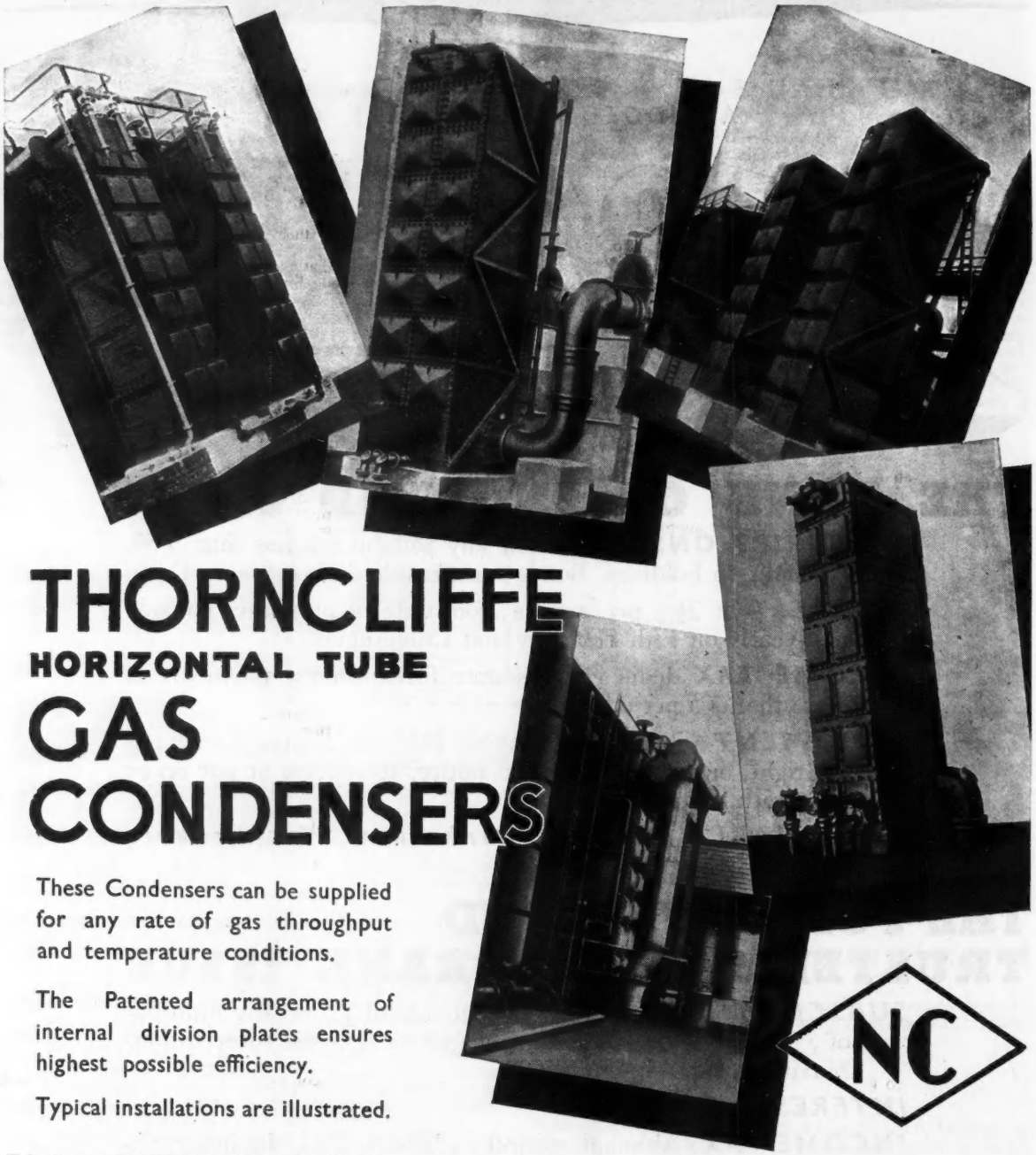

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Southern Association of Gas Engineers and Managers

Presidential Address

of

W. A. HOWIE

Engineer and Manager, Maidstone Gas Company

THE task of all gas undertakings, particularly the smaller ones, during the past few years of tension and war weariness has been almost entirely devoted to the maintenance of gas supplies in extremely difficult circumstances, leaving no time for individual experiments or development work. Many gas engineers of my acquaintance were due for a little respite from the strain under which they have been working during the war, and the relaxation during the two Victory days brought much relief to thousands of workers throughout the land. We all recognize, however, that there are many trials and tribulations ahead, and there is much to be done by engineers in gradually bringing both works and district to normal standards of efficiency.

I use the word "gradually" because we realize the tremendous amount of work which will be required of our good friends the contractors, who even now are at their wits' end to find the necessary labour and materials for projects already in hand.

We belong to one of the key industries in our country. I mention this because after all our war effort, and in spite of numerous difficulties and trials during the arduous and anxious times through which we have passed, especially in Southern England, very few of the general public and even highly placed officials yet appreciate the fact that without the Gas Industry the various munition works and other war factories could not have produced the war equipment.

In the past the Gas Industry has been primarily concerned in producing and distributing fuel in gaseous form, but for several years it has given much attention to the question of producing a satisfactory coke as a smokeless fuel. When one considers that in the domestic field alone the 750 million therms annually involved are doing the work formerly done by about 25 million tons of coal, and as those therms are produced from only 10 million tons of coal, it is high time that from a national point of view every encouragement should be given by Government Departments, local authorities, and planners of housing schemes, to the use of smokeless fuels produced by the efficient carbonization of coal.

Coal Supplies

As the years go by we are becoming more and more concerned regarding our coal supplies; early this year an eminent engineer declared that we have coal to last only 100 years and that the Lanarkshire coal mines are already approaching exhaustion, while special coals in Durham will last only 70 years. This is an alarming situation, and I suggest that, as far as possible, every ton of suitable coal mined should be processed.

Taking the 1938 annual output of 227 million tons, this is what happened to most of it.

(1) 40-million tons of the best coal were exported (17%)
(2) 45 million tons were used for domestic purposes in very low efficiency coal fires . . (20%)
(3) 55 million tons were used in factories and for other purposes . . . . . (24%)
(4) Only 40 million tons were processed . . (17%)

Most striking evidence was revealed by the Reid Committee of the urgent need to reorganize completely this basic industry, upon which all other industries are dependent for their existence. The recommendation of this Committee included the electrification of coal-mining equipment and underground transport, mechanization where possible, also improved lighting and ventilation.

I maintain that something drastic must be done by the coal mining industry to remedy the coal situation in this country when it is realized that the pithead price has increased by 150% since 1936.

To-day it hardly seems believable, but it is true, that when I was Chief Assistant Engineer with the South Shields Gas Company just before World War No. 1, I contracted for our coal supplies at 8s. 6d per ton delivered f.o.r. the gas-works. To-day we are all paying in the region of 55s. per ton, with some companies paying more than this, and the question arises, what do we get for our money?

I consider that the Gas Industry has suffered perhaps more than any by the disastrous condition of the coal industry; not only has the quality deteriorated, but delays in deliveries, and sometimes non-deliveries, have caused gas engineers many days of anxiety.

In this connexion we engineers in the South-Eastern Region are extremely grateful to our friend Mr. G. le B. Diamond, Deputy Regional Controller, for all his painstaking efforts on our behalf in regard to the supply of coal and labour, and I am pleased to announce that with the departure of Sir John Dalton, the Minister of Fuel and Power has appointed Mr. Diamond Regional Controller.

Now that nationalization of the mines is a foregone conclusion, it remains to be seen what success, if any, will be accomplished in regard to—

(*a*) Increase in output.
(*b*) Reduction in pithead price.
(*c*) Reduction of shale and stones.
(*d*) Reduction in absenteeism, and
(*e*) Ill-discipline of the rank and file.

From my experience as Coal Spokesman of the South-Eastern Region, I feel quite sure that most gas engineers are longing for the time to arrive when they can again purchase and receive the quality of coal most suited to their particular carbonizing plant, and at a reasonable price.

I venture to suggest that much of the growth of the gas and electricity supply is not due to economics but to convenience and easy utilization, and I am afraid that owing to the continued shortage of coal supplies in this country we are confronted with the possibility of drastic measures being imposed to curtail the use of both gas and electricity during the coming winter months.

You will notice that I say "in this country"; those words are used because I was amazed to learn from the Press that in June last 134,000 tons of British coal had been shipped to France, and yet, as Coal Spokesman for the South-Eastern Region, many of my gas engineering friends could testify to the difficulties I have experienced in my efforts to secure adequate and suitable supplies for their requirements.

The Heyworth Committee, set up by the Ministry of Fuel and Power to enquire into the affairs of the Gas Industry, is still sitting and taking evidence, and I feel sure that the Report submitted by the Association of Gas Corporations must have been a strong one having reference to the concrete achievements which have been recorded in the Technical Press of the various holding companies in the Gas Industry, particularly during the war years. At the general meetings of the holding companies I have noticed that the respective Chairmen have been very optimistic, and that many schemes for further development are being held in abeyance pending the findings of the Heyworth Committee.

Dear Coal: High Wages: Cheap Gas

We have entered upon a new future both in our national and industrial life, and the overwhelming majority now enjoyed by the present Government indicates that it can formulate its plans with less restraint than the previous Labour Government. Now that complete victory has been achieved, it is the earnest desire of everyone that wartime controls and restrictions should be removed as quickly as possible according to circumstances. The Government's plan for public ownership would seem, generally speaking, to follow the lines of the Reid Report on technical efficiency, but I do not think that this necessarily means that the Gas Industry will be subject to any closer control than that to which it is already subjected.

What I am more greatly concerned about is the relation of coal and wages to the price of gas; I feel sure that we are in for a period of dear coal and high wages, and all gas engineers are ever on the alert to find means of producing gas at the cheapest possible price. How can this be done at the present high level in coal and wages costs? I suggest the following for your consideration:

(1) Modernization of existing carbonizing plant.
(2) The cost of manufacture of carburetted water gas.
(3) Fuel expenditure index figure.
(4) Installation of electric detarrer.
(5) Electricity from the grid.

Having always been connected with provincial gas undertakings, and as the greater number of the members of this Association are interested in those undertakings, my remarks particularly refer to gas-works in the provinces.

Modernization of Carbonizing Plant

In introducing the subject of new carbonizing plant, I am putting forward my opinion that it is worth while spending money on new modern plant if it can be shown that there will be at least a saving of 1d. per therm in the net cost of gas production. By net "cost of production" I refer to coal, plus labour, less residuals.

For various sized works a saving of 1d. per therm means approximately in actual money per annum:

For a works producing per annum	£
250 million cu.ft.	5,000
500 „ „	10,000
750 „ „	15,000
1,000 „ „	20,000

In general, provincial gas-works have been provided with horizontal retort settings, usually comprised of 8 retorts per setting, with ascension pipes and hydraulic mains with the old design of setting. We all know

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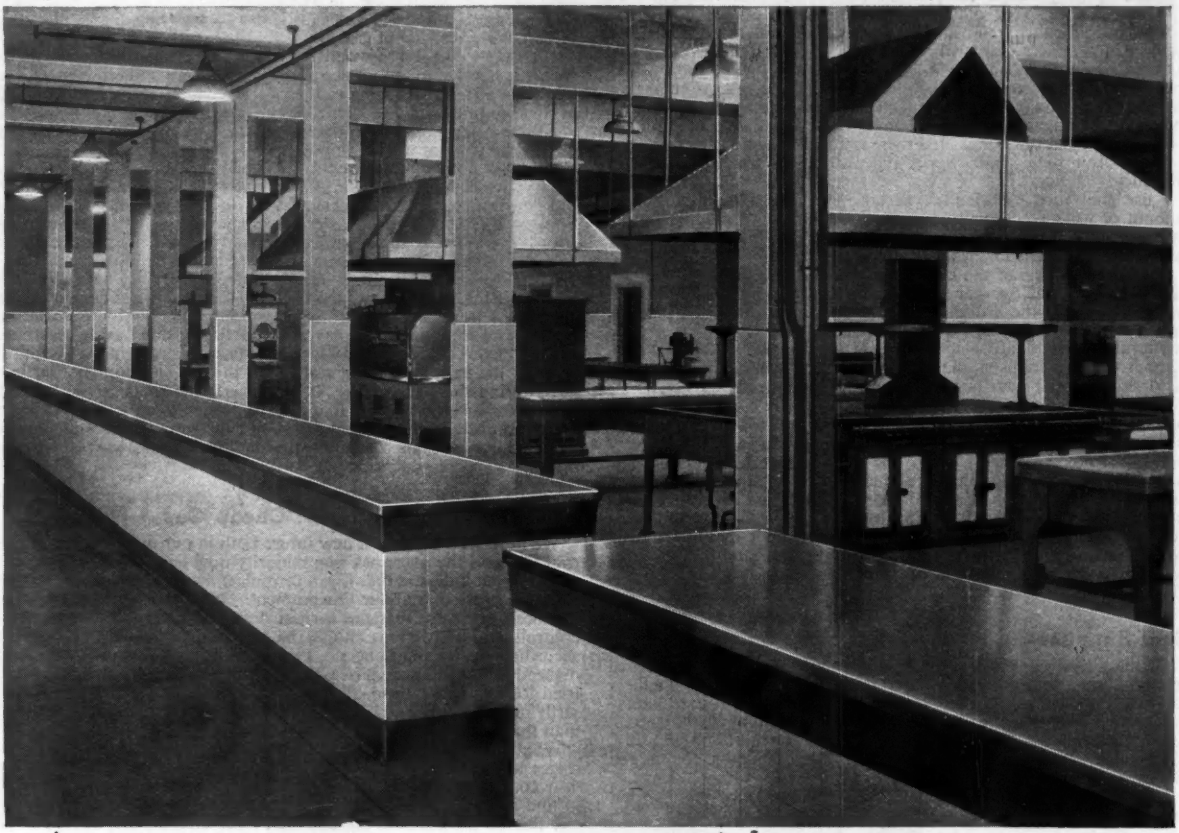

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of the hot bull's-eye retort, the comparatively cool bottom retorts, stopped pipes, and shallow producers necessitating frequent filling to avoid complete combustion of the producer gas taking place in the producers instead of in the combustion chambers, due to stokers failing to keep the producers filled with coke according to schedule, particularly on the night shift and at week-ends. In regard to the handling of the red hot coke, the smallest undertakings still use the hot coke barrow; medium sized undertakings use either the hot coke conveyor or hot coke skip running on rails.

With this picture in mind, it is surprising to me that in the year 1945, men called "stokers" can be found with the "guts" and stamina to undertake the necessary carbonizing operations under such conditions of heat and smoke, especially in the rodding of ascension pipes and poking the red hot coke into badly designed feeding doors of the producers.

In the past, my predecessors at Maidstone have wisely devoted their attention to the modernization and enlargement of the exhausting, compressing, and purification plants, and it has fallen to my privilege to modernize the carbonizing plant, which work is now taking place in stages.

The existing horizontal retort house contained three benches of 6 settings—*i.e.*, 18 settings in all—of very old design, each setting containing the usual 8 retorts, 22 in. by 16 in. by 21 ft. long, and provided with shallow producers and a mixture of step grates and grill grates, shallow and narrow hydraulic mains, and only one retort house governor for the three benches, with the consequent great variation of vacuum in each hydraulic main.

The original settings were designed by Mr. John West as long ago as 1893—52 years ago—for manual charging machinery, and no doubt at that time they were looked upon as the very latest in carbonizing practice. However, when converting to mechanical stoking in 1914, the mistake was made in not reconstructing the benches to then modern practice, and even in 1921 benches Nos. 2 and 3 were renewed still to the old design, and finally in 1928 Bench No. 1 was erected on the same lines. For many years the practice had been to work Nos. 1 and 2 benches according to gas requirements, whereas No. 3 bench had been standing idle for over 12 years. However, by reason of greatly increased gas output since the war and the severe winter of 1942, it became necessary to put No. 3 bench to work again, with disastrous results.

The retorts in No. 13 setting completely collapsed and hurried resetting work had to be put in hand immediately, while men were engaged in overhauling retort doors, cleaning out pitched-up hydraulic mains, and generally tightening up the ascension and bridge pipes, as each setting was put to work.

Our experience of working the whole of the 18 settings with only one charging machine, owing to shortage of labour, and only two overhead coal hoppers in the house of very small capacity instead of continuous hoppers throughout the house, definitely convinced me that an installation of modern carbonizing plant was absoluetly necessary for the following reasons:

(1) The abnormal amount of labour required.
(2) The conditions under which this labour was employed.
(3) The poor results obtained from the plant owing to its condition.
(4) The high cost of manufacture and maintenance.

To-day five modern horizontal retort settings with 10 retorts per setting are being installed to replace bench No. 3.

A complete vertical or horizontal installation on a new site was considered, but this was found to be impracticable because the available sites were either too far away from the coal deliveries, or too far away from the coke storage yard and overhead coke screening plant.

It was therefore decided to replace bench No. 3 as soon as possible by modern settings of 10 retorts per setting, complete with Congdon scrubber standpipes, Le Fleuve coke conveyor, static coke screen and automatic skip hoist and waste heat recovery. An installation of horizontal retort carbonizing plant was chosen because Maidstone has always enjoyed a good coke market, and it is well known that this design of plant is capable of carbonizing almost any class of coal with the production of high grade coke. After receiving the approval of the Ministry of Fuel and Power, an order was placed with Messrs. Gibbons Bros., Ltd., and the work is now proceeding. It is hoped that the new plant will be in operation when the members of the Association visit Maidstone next year, either in May or June.

It is anticipated at a later date to follow on with the replacement of bench No. 2 by the installation of a further seven settings of retorts.

I will not weary you with details of estimated savings, but the net cost of gas production—*i.e.*, coal, plus labour, less residuals—is as follows:

With the old settings	.	3.91d. per therm.
With the new settings	.	2.61d. „
Showing a saving of	.	1.30d. „

In this case of reconstruction, 0.30d. per therm of gas produced is sufficient to cover the annual interest on the capital expenditure, leaving the round figure of 1d. per therm available for selling price reduction.

Present Day Cost of Carburetted Water Gas

I wonder how many engineers have had the opportunity of working out the actual cost of manufacturing carburetted water gas as against coal gas at to-day's prices. Again I will not weary you with detailed figures, but in connexion with a new scheme we compared our costs for the full year of 1944 with the following results:

		Price per therm.
500 B.Th.U.	C.W. gas	11.54d.
500 B.Th.U.	Coal gas	3.91d.

The figure of 11.54d. for the C.W. gas is for the coke and breeze, wages, and gas oil (including the oil subsidy).

The figure of 3.91d. for the coal gas is for coal, less residuals, plus carbonizing wages.

The cost of the C.W. gas is only 1.46d. per therm lower than our standard selling price of gas, and if we could return to the manufacture of coal gas only, there would be an annual saving to the Company of £10,600, which would allow us to reduce the price of gas by nearly 1d. per therm.

However, we all know that at the moment we are still required to work our C.W.G. plants to the fullest capacity, and I note that the oil subsidy is to continue for a further period. When the oil subsidy does terminate, and assuming the present price will continue, our C.W.G. production cost per therm will be increased by 3.16 to 14.7d. per therm, which is 1.7d. higher than our standard selling price of gas of 13d. per therm.

The comparison does suggest that all engineers should keep a watchful eye on gas production costs.

Fuel Expenditure Index

On the question of fuel efficiency my experience has been that "*gas made per ton of coal*" is no criterion to efficient gas production from a national point of view (*i.e.*, as calculated by the formula used by the Gas Engineering Advisory Board, No. 12 Region), for the reason that "*coke produced for sale*" contains by far the greater number of therms (268.8 therms per ton), as compared with gas, tar, and benzole produced from the same quantity of coal.

To illustrate this point of view I give below a statement showing an actual comparison of two undertakings called A and B.

Undertaking A produces 200 million cu.ft. of gas per annum, and undertaking B produces roughly 500 million cu.ft. per annum.

Undertaking.	Gas made per ton coal (cu.ft.).	Coke available for sale per ton coal (cwt.).	Tar made per ton coal (gall.).	Benzole made per ton coal (gall.).	F.E.I. figure.
A	13,946	11.4	8.36	1.45	21.65%
B	18,425	5.5	11.19	2.20	42.3%

The conclusion, therefore, is that for every 1 cwt. of coke converted into gas one should be able to produce an equivalent of 2,688 cu.ft. of 500 B.Th.U. quality gas in order to maintain the same fuel expenditure figure, and that being so it behoves all carbonizing engineers to be always on the outlook for wastage of fuel, particularly in connexion with the furnaces of the carbonizing plant.

If anything in the nature of a national gas grid is contemplated there is no doubt that many small gas undertakings with an output of less than, say, 100 million cu.ft. per annum will be closed down and possibly used only as gasholder stations to supply the small towns or villages. Much care and thought will, of course, have to be exercised in deciding which undertakings will be closed down, because gas supply is entirely different from electricity supply in the fact that a gas-works also supplies coke.

As a member of the Southern Regional Gas Advisory Board, I have been greatly surprised at the number of medium-sized undertakings (200/400 million cu.ft. per annum) which can record fuel expenditure index figures of 18 to 25%, and that being so, I think it would be agreed that a wise plan would be to retain those works in operation at full capacity, any additional gas requirements being supplied in bulk by the nearest larger undertaking.

Electrical Tar Precipitation

Many works of course have had in operation electrical detarrers for several years, and most engineers are acquainted with the principle involved. We have been considering the question of the difficulties experienced at the Maidstone Works with regard to the dry purification plant, and after investigation it was found to be due to tar fog and naphthalene. We have the usual tar extractors and ammonia washers, but on test it was found that tar fog entered the purifiers.

It was frequently necessary to take the covers off the purifiers in order to remove the top layer of oxide, which caused heavy back-pressure after a short period of working, and other than the cost incurred and shortage of labour to do this work, &c., there was always the risk of slight traces of H_2S being found in the gas delivered to the district, especially in very cold wintry weather, due to the fact that we have only four purifiers.

So far as provincial undertakings are concerned, my experience indicates that, for safe working and ease of mind, it is desirable to have at least five purifiers in series, all arranged for the backward or forward arrangement of working.

As the tar fog is removed in one operation in a detarrer, a higher

efficiency in the operation of the purifiers is assured, resulting in much less handling of the oxide due to back-pressure, and a higher price is obtained for the spent oxide due to the entire absence of tar. In addition, as the detarrer is generally fixed after the exhauster, the performance of the washing plant following this unit is accordingly greatly increased. Power saved on the rest of the works by installing an electrical detarrer more than counterbalances the power requirements of the set itself.

Detarrers are not expensive to install, the Maidstone installation, which is capable of dealing with 4 million cubic feet of gas per day, costing roughly £2,000.

The plant was installed by Messrs. Simon-Carves, Ltd., of Stockport, and the precipitating vessel is of the plate type.

The electrical equipment is shock proof, consisting of a tank with oil immersed transformers, selenium rectifiers, condensers and moving coil regulator, with the instrument panel mounted on the front of the tank. This equipment requires no screens or guards, and is placed in the existing machinery room.

With regard to the running cost of electricity this is very low indeed, being in the neighbourhood of 0.015d. per therm.

A continuous alternating current is required, but works having D.C. current can, of course, have a converter installed, at a cost of a few hundred pounds.

It seems strange to-day for anyone to mention the word naphthalene, but we have recently found traces of it on the district, causing the usual stoppages, and our explanation is that the benzole plant had to be put out of action many times for alterations to the plant with an endeavour to increase the production of benzole, and also the shortage of gas during the severe cold spell last winter.

Electricity from the Grid

It has been the usual custom for many years for most undertakings to generate their own electric current either by gas engines or steam engines with every satisfaction, and, of course, there was the publicity value. To-day, however, even with fairly large generating plants I doubt whether they can compete with the public supply from the grid.

We have three gas engine driven sets, and with the introduction of new carbonizing plant it became necessary to consider large electric sets, or alternatively the purchase of a bulk supply from the Maidstone Corporation. It was decided to purchase a bulk supply on the following estimates:

Over a two-year period the consumption of gas in the gas engines has amounted to 45.3 cu.ft. per unit generated, with an annual demand of 250,000 units.

Taking gas consumed at net cost into holder—viz., 7d. per therm—and allowing for lubricating oil, maintenance, and insurance, the cost per unit generated is 3.91d., and for 250,000 units the annual cost is £4,073

Even taking gas consumed at net cost of coal only, and again allowing for lubricating oil, maintenance, and insurance as above, the cost per unit generated is 1.79d. and for 250,000 units the annual cost is £1,864

Now we will compare these figures with the price quoted for a bulk supply from the grid, which is as follows:

£6 per annum per K.V.A. maximum demand, and all electric current consumed charged at 0.7d. per unit.

In our case the maximum demand will be 70 K.V.A.

Annual cost will therefore be 70 × £6 equals £420

250,000 units at 0.7d. equals £625 £1,045

The annual saving to the Company by taking electricity from the grid will therefore be (even when compared with gas at net cost of coal only) £819

It has been decided to retain the existing generating sets as a stand-by in case of labour troubles in the electrical industry.

Any reduction in the price of coal during the next few years is problematical, the wages of miners have been stabilized for four years, and chairmen of railway companies have hinted that railway rates will have to be increased. We have also been warned that we must be prepared for high taxation for many years to come. It is obvious that six years of war on the modern scale must leave a nation financially embarrassed when the war has been financed in part by purchases from abroad, not offset by a like value of sales, and by the loss of a large proportion of capital held abroad. We are in debt to other nations and to each other.

The debt to other nations can only be paid in goods, and high taxation obstructs production by increasing costs and lessening the individual's incentive to work. High rates of income tax led to absenteeism even at a time when absenteeism reduced the output of goods vitally needed to win the war.

If satisfactory work is to be done the tax collector must take less than he has been doing from the wage envelope, and the money remaining after he has helped himself must be worth more than it is at present. High taxation impedes an increase of total wealth by reducing incentive to produce on the part of the workman and employer, and by obstructing consumption.

We all know that the Government has to devise means of raising money through taxation, but cannot we hear less about the necessity of taxation remaining high and more about ways and means for its reduction?

The Institute of Fuel Student's Medal and Prize has been awarded to Mr. J. M. Austin, a Student Member of the Institute and also a Student of the Institute of Petroleum.

The Nico Light Company, Ltd., is to be known as the Nico Light Engineering Company, Ltd. The change has been made to convey a better impression of the firm's range of manufactures.

The Ministry of Works announces that four "specimen" Swedish pre-fabricated houses have arrived at Hull Docks. They are the first of 5,000 permanent two-storey timber houses, specially designed for British conditions, ordered in Stockholm last May. Swedish foremen now on their way to England will demonstrate their erection at Abbots Langley, Hertfordshire. Two similar houses will be erected at Tannockside, Lanarkshire, where they will serve the same purpose of training the British operatives, who will erect the remainder of the houses on order. The specimen houses will be used for a detailed study of erection methods, so that when bulk deliveries commence, erection can be carried out as rapidly as possible.

At the Invitation of the French Government, a party of British industrialists, representing the Federation of British Industries, is leaving for Paris, under the leadership of Sir Clive Baillieu, President of the F.B.I., and Lord Dudley Gordon. The visit arises out of the conversations, held in London last May, with a number of French industrialists, when it was decided to set up a permanent Anglo-French Industrial Liaison Committee to examine the possibilities of extending the trade interests between the two countries. The delegation will be accompanied by Mr. Charles Ramsden, the F.B.I.'s Foreign Director, who is going on from Paris to Italy and Switzerland to extend the Federation's connexions in those countries.

A Pledge that the U.S. War Production Board, or its successor agencies, would continue the work on standardization which had been developed in wartime was given by Mr. William L. Batt, Vice-Chairman for International Supplies of W.P.B., when speaking at the third Conference on Unification of Engineering Standards in Ottawa. Mr. Batt, who is also the U.S. member on the Combined Production and Resources Board, in urging Britain, Canada, and U.S.A. to capitalize on wartime standardization experience, added that if one accepted the assumption that war was becoming increasingly scientific and technological, then one must also accept the fact that any shortcomings in Anglo-Saxon countries in welding together their common efforts was deserving of the roundest criticism.

A Scottish Engineering Students' Association has been formed with its headquarters at Glasgow to provide means for young men in all branches of engineering to meet and discuss papers and interchange views and ideas. It is intended to hold six evening meetings annually in Glasgow, and at least one additional meeting in some other Scottish centre, to publish transactions, to arrange works visits, and to organize social events. The activities of the Association are not expected to interfere with those of existing institutions and societies. Membership is limited to members of recognized technical institutions and societies. Persons under 30 years of age are eligible for membership, and there is no subscription fee, the funds being provided by prominent Scottish engineers and shipbuilders. The address of the Hon. Secretary is 420, Sauchiehall Street, Glasgow, C. 2.

The Ministry of Works announces that certificates to purchase builders' manufactured goods of iron and steel (other than canteen equipment) are no longer required unless the iron and/or steel content of the individual article is more than 5 cwt. Hitherto certificates to purchase have been required when the individual article contained 3 cwt. or more of iron and/or steel. This procedure does not apply to heat storage cookers, which require a certificate to purchase whatever the weight. Merchants and suppliers are reminded that the "M" authorization is primarily an instrument to acquire iron and steel for manufacturing purposes. Bulk authorizations are at present given by the appropriate Government Departments to manufacturers of builders' goods required for civilian purposes up to the production capacity of the individual manufacturers, and within the limits of the raw materials available. It is not necessary for users to apply for "M" authorizations to acquire manufactured goods, because requirements are met out of such bulk authorizations.

The Liverpool Gas Company have recently taken delivery of a new Diesel type locomotive for their Garston Works. The locomotive is a Drewry 150 h.p. diesel mechanical machine supplied by the Drewry Car Company, Ltd., London, in conjunction with the Vulcan Foundry, Ltd., of Newton-le-Willows. It is of the 4-coupled (0.4.0) type with a rigid wheelbase of 6 ft. 3 in., enabling the sharp curves on the Garston site to be negotiated without difficulty; the weight in running order is 23¼ tons equally distributed. The power unit consists of a Gardner 6L3 engine developing up to 153 b.h.p. at 1,200 r.p.m. and equipped with 24-volt electric starting; starting is almost instantaneous under all conditions. The fuel used on the Garston locomotive is the normal gas oil used on the water gas plant. The quantity being used at the present time is averaging 36 gallons per week for an operating time of approximately 42 hours.

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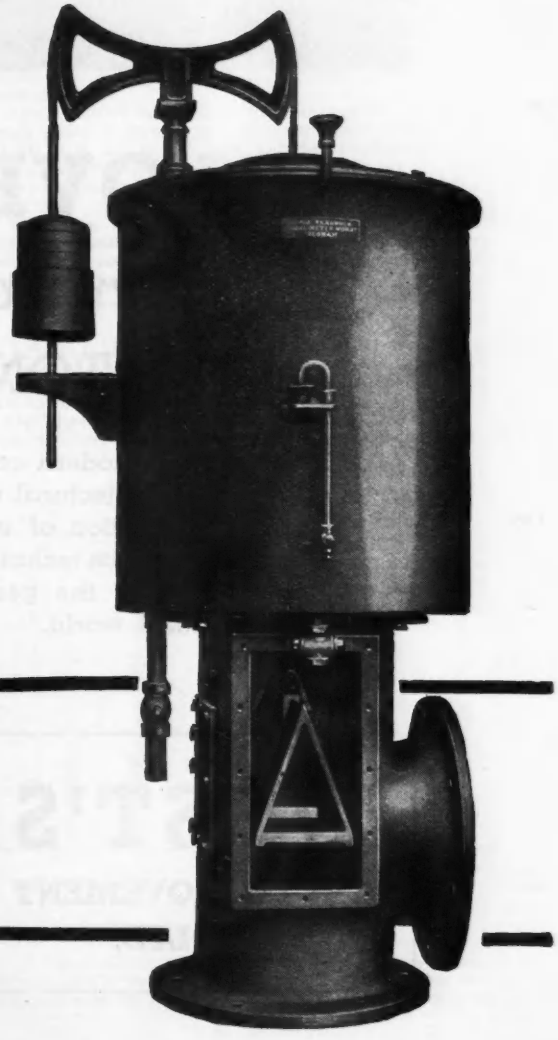

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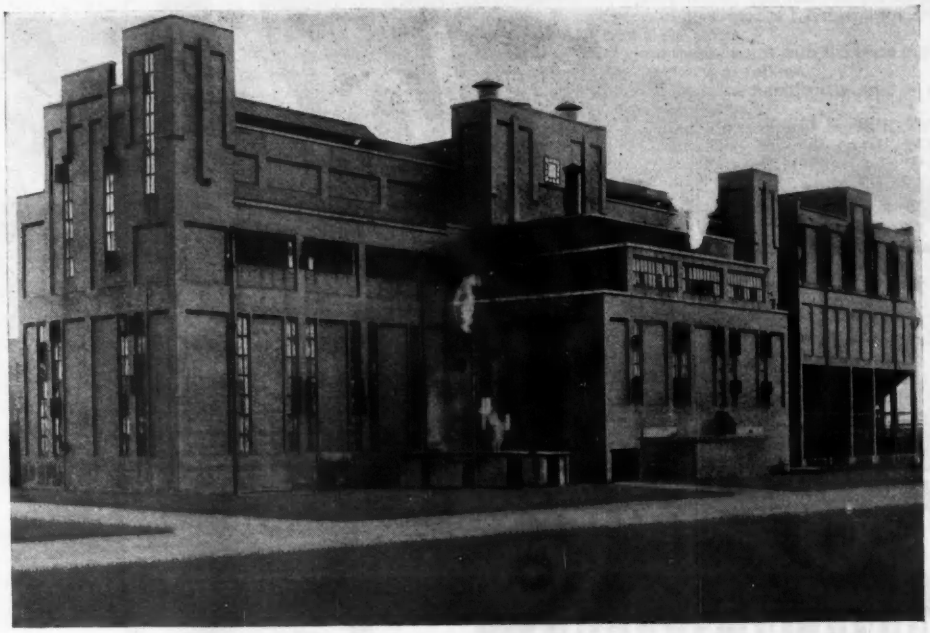

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COMMUNICATION No. 230—PROCEEDINGS OF THE INSTITUTION OF GAS ENGINEERS 1939-40, p. 455.

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Wartime Development at Airdrie*

By DAVID L. DICKSON,

Gas Engineer, Airdrie

(*Continued from p. 504*)

Owing to the fact that our conveyors were steam driven and the screen electrically driven, we did not incorporate means for starting the one with the other. The conveyor being used for both coal and coke, it was necessary to put one or the other into operation manually as and when required. Not only so, we insist upon the top plant man inspecting the starting up of the screen at each draw to ensure that no building up of coke has already taken place. As already stated, the screen proved extremely silent, and to act as a warning it was necessary to install a light to indicate when the screen was in operation. At the same time we re-arranged our wiring circuit to incorporate the control of a water pump in the following manner: As the screen is put into motion contact is made whereby a motor-driven water pump is brought into use after a lag of two minutes, and water is sprayed in a fine spray over the surface of the coke, after it has been dry screened. When stopping, the screen stops first and the pump shortly after.

The pump has a separate switch whereby it can be put into commission without the screen, a special key being used for this switch to prevent any unauthorized person using it. The reasons for this arrangement are:

(1) To ensure against fire.
(2) To allow dry screening and so prevent undue corrosion of elevator buckets.
(3) To lay the dust.

The alternative switch provided gives us full use of the pump at any time, either for fire fighting, or washing-down purposes, without the screen being in commission.

The 0/¼ in. screenings have so far proved unsaleable, and apart from giving a few loads to the local golf club free to help conditioning the turf, we have up to the present been unable to obtain a market for them. Experiments were made with a view to manufacturing breeze partition blocks, but this proved unsuccessful owing to the large amount of dust and the smallness of the breeze.

The ¼/½ in. material has proved very successful as a coke nut and commands a high price. At present we obtain 43s. 6d. per ton f.o.r. our works, and we have quite a ready market for central heating and greenhouse heating, a small percentage being used by ourselves for steam-raising purposes.

The amount derived from ½/1¼ in. we find is barely sufficient at times to keep our producers going, and very rarely we have to augment it by the addition of larger sizes. This cleaned, sized fuel we find excellent for producer purposes, and since we commenced using it have had little or no producer trouble, heats having been maintained in excellent condition.

Regarding the larger sized coke, we have heard neither praise nor condemnation. This, of course, is no criterion at the present in view of the extreme scarcity and the consequent urgent demand. Our own experience, however, has proved that our water gas plant gives much better results with this class of fuel.

Carburetted Water Gas Plant

Early in 1943 it became apparent that with our rapidly increasing output and the prospects of a large shadow factory being set up within our area of supply, we would find great difficulty in maintaining all requirements with vertical retort gas only. It was therefore decided to re-modernize an old carburetted water gas plant of the Humphreys & Glasgow type originally installed in 1920. This unit had been out of commission since 1940, and was in no fit state to stand up to any prolonged working. Specifications for the alteration and modernization of this unit were issued. It was decided to alter the plant to back run process, provide automatic control, and do away with the obsolete hydraulic lift, replacing it with an overhead bunker of 24 hours capacity fed by band conveyor.

The bunker and conveyor were built by local labour, and the alteration to the plant was made by Messrs. Tully, Sons & Co., of Newark. The work consisted in removing all hand controls and the old type hot gas valve, replacing it with a brick-lined distance piece into which was inserted the secondary air intake to carburetter; cutting out the old down-run connexion and patching and bricking up the generator lining and shell; removing the original seal box, supplying a new wash box complete with machined up-run and down-run dip pipes which were provided with quick acting under-water type gas operating valves. Also supplying a complete new set of blast valves with matching piece for generator shell and automatic control device complete with steam distributing chest, all levers and connexions, totally enclosed operator driving unit and duplex oil pump complete with automatic pressure control valve. Messrs. Tully also replaced one of our existing 15 b.h.p. steam turbines by a centrifugal type blowing fan direct coupled to a totally enclosed fan-cooled squirrel cage two-speed motor mounted on a common bed-plate. The motor for this unit is duel wound and permitting of 35 b.p.h. being generated for blast purposes during the blow, while for the idling period the 4½ b.h.p. winding is brought into commission. The change-over switch for this operation is attached to the mechanical operator so that the full and reduced speed working is synchronized with the blow and run periods of the plant.

On the reduced h.p. winding the pressure in the blast main is actually lower than the pressure in the generator, but to counter any possibility of gas leaking back into the blast main and forming an explosive mixture, the blast main above the generator blast valve is fitted with an automatically controlled, positive type release valve, which permits of the blast main being air swept, and further, when the generator blast valve is in the shut position there is an outlet groove cut in the spindle allowing air to be swept down past the valve seat and out to the atmosphere. All blast valves are so made with a square spindle that they can be turned *in situ* and so help to reseat the valve without dismantling. As a further precaution the full blast pressure comes on before the main blast valve is opened and the main is thus thoroughly purged. This plant was completed in August, 1944, and so urgent were our requirements that it was put into use immediately, without a makers' test, and has since worked for an average of 12 hours per day, being off during that time, apart from clinkering period, for no more than 1½ days to permit of clearing an obstruction in the carburetter. Since results speak for themselves, success of this work can be judged by the fact that whereas previously the plant required two men constantly to operate it (one for coke handling and the other for plant operation), now, except for one hour per shift, the plant is operated by one man, who can in three to four hours put up sufficient coke to do a 14-hour period and still have ample time to keep the place clean, oil and grease all machinery and pump traps.

The output of the plant has been increased by at least 40%. Formerly owing to its poor condition we were fortunate if we obtained 15,000 cu.ft. per hour. Now with improved plant conditions and better screened coke we are able to get an average of 21,000 cu.ft. per hour, and under test conditions we have reached 24,000 cu.ft. per hour.

The blower motor consumes on an average 6-7 units of electricity per hour (measured by individual meter), so that with current at 1½d. per unit, the cost averages out at 9d.-10½d. per hour for electricity for blast purposes.

Future Planning

It is only fitting that having come so far in our present reconstruction we should look back, check the results attained, criticize from a constructional standpoint the partially completed plan of reconstruction, and so build upon the experience gained.

Our growth in Airdrie has been phenomenal, as is shown in accompanying chart (fig. 6). The output of manufactured gas has risen

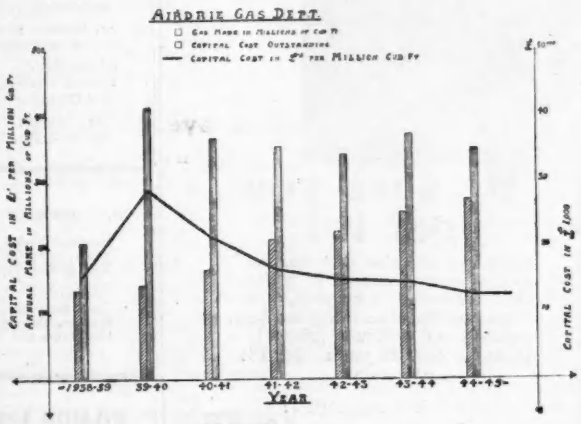

FIG. 6.

from 136.4 millions per annum to 273.5 millions per annum, an increase of 100% (excluding coke oven gas sold). Our weekly output has been more than doubled, as can be observed from graph (fig. 7).

(*To be continued*)

* Paper to the North British Association of Gas Managers, Sept. 7.

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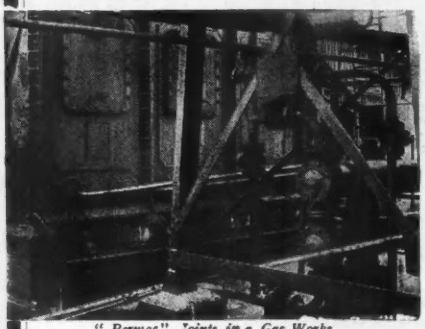

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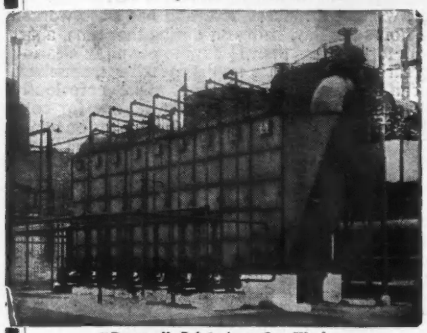

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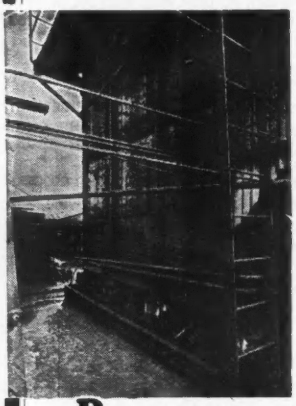

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Products Prices—Stocks and Shares

The London Market Oct. 15.

There are no changes to report in the prices of Coal Tar Products.

There have been two developments of interest in connexion with Coal Tar Products, the first being the cancellation of Government contracts for toluene, and the second the issue of the Control of Benzole and Allied Products Order, 1945 (S. R. & O. 1945, No. 1064), which came into force on Sept. 1 and brings all Coal Tar Spirits under one and the same Order.

As from March 5, by the Coal Tar Products Prices Order, 1945 (S. R. & O. 1945, No. 229), the maximum price of Pitch for briquetting has been increased to 60s. per ton f.o.r. supplying works, and the prices for Road Tar, as fixed by the Coal Tar Products Prices Order, 1943, S. R. & O. No. 1528, have been increased by one half-penny per gallon. There is also an increase of 5s. per ton in the price of standard Creosote/Pitch Mixture.

Coal Tar Products Prices (No. 2) Order, 1944 (S. R. & O., 1944, No. 1051), allows increases in the maximum prices for all forms of Naphthalene.

The Provinces Oct. 15.

The average prices of gas-works products during the week were: Pitch and Crude Tar,* Toluole, naked, North, 90's. 2s. 4d. to 2s. 6¼d., pure, 3s. 2¼d. Carbolic acid, 60's, anthracene, creosote oil (hydrogenation), coal tar oils (timber preservation, &c.), and strained anthracene oil controlled by the Coal Tar Products Prices Order, 1943, dated Oct. 20, 1943 (S. R. & O. 1943, No. 1528), operative from Nov. 15, 1943, Naphthalene controlled under S. R. & O. 1944, No. 1051, operative from Sept. 22, 1944.

Attention is called to Coal Tar Products Prices Order, 1945 (S. R. & O. 1945, No. 229), referred to on p. 305, "JOURNAL" of March 7.

* In regard to pitch and crude tar prices we would ask readers to refer to the editorial note on p. 396 of the "JOURNAL" for Sept. 10, 1941.

Scotland Oct. 13.

Throughput is well maintained and export enquiries are numerous. Refined tar*: Yield to distillers is 5d. per gallon *ex* Works, naked. Creosote oil: Timber preserving quality,* 5½d. to 6½d.; hydrogenation oil,* 5¾d.; low gravity or virgin oil,† 7½d. to 7½d.; benzole absorbing oil,* 6½d. to 8d. per gallon. Refined cresylic acid* is 3s. 6d. to 4s. 6d. per gallon *ex* Works, naked, according to quality. Crude naphtha†: 7d. to 8d. per gallon. Solvent naphtha*: Basic prices delivered in bulk, 90/160 grade, 2s. 10d., and 90/190 Heavy naphtha, Unrectified 2s. 0½d.; Rectified 2s. 4d. per gallon. Pyridine†: 90/160 grade, 13s., and 90/140 grade, 15s. per gallon.

* Price controlled. † Uncontrolled.

Stock markets were mainly quiet throughout last week, although the general tone was firm, particularly among British Funds. The chief topic towards the close was, of course, the Bank of England Nationalization Bill. The effect on the Bank stock was favourable, and the improvement was also reflected in other "near nationalization" groups, including some leading gas stocks. The prices of gas securities on the whole showed little change on the week, but it will be seen that Gas Light units closed 9d. higher and South Metropolitan also improved. In the Supplementary List the two Mediterranean preference stocks both closed 5 points up.

The following are the few price changes on the week:

OFFICIAL LIST

Bombay (*x.d.*)	42/—45/—	Oct. 8
Gas Light Units	21/6—22/6	+—/9d.
Severn Valley 4½ p.c. Cum. Pref. ...	22/—23/—	+—/6d.
South Metropolitan Ord.	90—93	+1½
Southampton Ord.	108—113	+1½

SUPPLEMENTARY LIST

Malta and Mediterranean 7 p.c. 1st Pref.	90—100	+5
Ditto 7½ p.c. 2nd Pref.	90—100	+5

PROVINCIAL EXCHANGE

Sheffield Cons.	143—147	—3½

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Tube Bending Machines (Hand and Power). Tube Bending Specialists.

65, Calshot Street, King's Cross, London, N. 1. 'Phone: Terminus 4714 (2 lines).

We can supply machines for bending Gas and Steam Piping from ¼ in. to 2 in. in the cold state.

Arkon

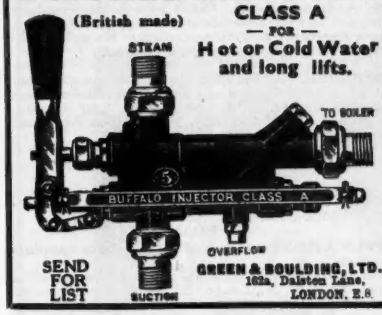
INSTRUMENTS

Gas Flow Recorders and Indicators
Pressure and Vacuum Recorders and Indicators
Full Scale or Inclined Gauges

WALKER, CROSWELLER & CO. LTD.
CHELTENHAM, GLOS. Cheltenham 5172

BUFFALO INJECTOR

(British made) CLASS A — FOR — Hot or Cold Water and long lifts.



SEND FOR LIST

GREEN & BOULDING, LTD. 162a, Dalston Lane, LONDON, E.8.

BOOKS

ENGINDEX. New Directory, Bibliography and Information Service for Engineers. Fully Comprehensive, always Up-to-Date, and essentially personal. Send stamp for particulars. BCM/ENGINDEX, London, W.C. 1.

CONTRACTS OPEN

LOUGHBOROUGH CORPORATION

(GAS DEPARTMENT)

TENDERS are invited for the supply and erection of a Connersville or similar type EXHAUSTER of 100,000 cu.ft. per hour capacity, driven by high speed steam engine.

Specification and other particulars may be obtained from the Gas Engineer, Gas-Works, Loughborough.

Tenders, in plain sealed envelopes, endorsed "Exhausters," should be delivered to the undersigned not later than Monday, November 5.

Town Hall, Loughborough. A. GWYNNE DAVIES, Town Clerk.

October 10, 1945.

SIDMOUTH URBAN DISTRICT COUNCIL

(GAS DEPARTMENT)

CONCENTRATED AMMONIACAL LIQUOR PLANT

THE Council invite Tenders for the Supply, Delivery and Erection of a CONCENTRATED AMMONIACAL LIQUOR PLANT having a capacity of 120 gallons per hour crude liquor.

Particulars can be obtained from the Engineer and Manager, Gas-Works, Sidmouth. Sealed Tenders in plain envelopes, endorsed "Con. Liq. Plant," to be received by the undersigned not later than Monday, November 12, 1945.

Council Offices, Sidmouth. R. PICKARD, Clerk of the Council.

October 9, 1945.

COUNTY BOROUGH OF ROTHERHAM

(GAS DEPARTMENT)

TENDERS are invited for the Supply, Delivery and Erection of a 3-million SPIRAL GUIDED GASHOLDER, together with Steel Tank and Foundations.

Specifications and conditions of contract may be obtained from the Engineer and General Manager, Gas-Works, Frederick Street, Rotherham.

Tenders, to be enclosed in envelope endorsed "Gasholder" and not bearing any mark indicating the sender, must be delivered to the undersigned not later than Monday, November 12, 1945.

The Corporation does not bind itself to accept any Tender.

Municipal Offices, Rotherham. CHAS. DES FORGES, Town Clerk.

TREDEGAR URBAN DISTRICT COUNCIL

(GAS DEPARTMENT)

THE above Council invite Tenders for the Supply, Delivery and Erection of the following plant at the Council's Gas-Works:

(*a*) CONDENSER.
(*b*) COKE SCREENING and GRADING PLANT.
(*c*) STATION METER.
(*d*) WASHER-SCRUBBER.
(*e*) TAR PUMP.

Specification and Conditions of Tender may be obtained from Mr. S. L. Filer, Engineer and Manager, Gas Department, Poplar Road, Tredegar, Mon.

Tenders, in sealed envelopes (which shall not bear any name or mark indicating the sender), endorsed "Gas Works Plant," must reach the undersigned not later than 12 noon on Saturday, November 3, 1945.

Council Offices, Bedwellty House, Tredegar, Mon. OLIVER LLEWELLYN, Clerk of the Council.

October 9, 1945.

PLANT &c. FOR SALE & WANTED

'PHONE 98 STAINES.

FOR SALE.—24 ft. by 9 ft. and 17 ft. by 6 ft. Cylindrical Tanks; Thompson Lancashire Boiler 24 ft. by 7 ft., 120 lb.; 34 kw. Browett 220 volt Steam Generating Set; Weir Feed Pump 8¼ in. by 6 in. by 18 in.; Tangye 3-Throw Hydraulic Pump 3½ in. by 6 in.; Receiver 30 ft. by 7 ft. dia., dish ends ½ in. plate.

HARRY H. GARDAM & CO., LTD., STAINES.

SIDMOUTH URBAN DISTRICT COUNCIL

(GAS DEPARTMENT)

CONCENTRATED AMMONIACAL LIQUOR

THE Council invite offers for the PURCHASE of Concentrated Ammoniacal Liquor.

Particulars can be obtained from the Engineer and Manager, Gas-Works, Sidmouth. Offers in plain envelopes endorsed "Ammoniacal Liquor" to be received by the undersigned not later than Monday, November 12, 1945.

Council Offices, Sidmouth. R. PICKARD, Clerk of the Council.

October 9, 1945.

COUNTY BOROUGH OF STOCKPORT

(GAS DEPARTMENT)

FOR SALE.—WASTE HEAT BOILER. One Ruston and Hornsby Horizontal Multi-tubular WASTE HEAT BOILER. Steam raising capacity 10,000 lb. per hour at 130 lb. per sq. in. pressure from feed water at 120° F.

Boiler 7 ft. 3 in. diameter, 17 ft. long between tube plates, 250 tubes 2 in. outside diameter, 50 stay tubes 2½ in. outside diameter. Re-tubed 1943.

Complete with mountings and induced draught fan.

All particulars and facilities for inspection can be obtained from T. Reynolds, M.Inst.Gas E., County Borough of Stockport, Gas-Works, Portwood, Stockport.

Sealed Tenders marked "Tenders for Waste Heat Boiler" should be addressed to the Chairman of the Gas Committee, Town Hall, Stockport, and be received not later than 9 a.m. on Friday, November 9, 1945.

The Corporation do not bind themselves to accept any Tender.

October 8, 1945. ARTHUR BOND, Town Clerk.

TO FACTORY OWNERS AND OTHERS

GOVERNMENT SURPLUS BENCHES. With the progressive closing down of Government War Factories, large quantities of second-hand heavy timber benches of solid and durable construction will from time to time become available for disposal in various parts of the country. A limited quantity is available for immediate delivery. The Benches, which are of varying types, condition and sizes up to 12 ft. long, 4 ft. wide, 3 ft. high, with 1½-in. to 3 in. tops, suitable for assembly, packing and general purposes, will be for sale in minimum quantities of a dozen, and prospective purchasers should furnish particulars of their present or future requirements, giving quantities and approximate sizes, when further details with prices will be supplied as surpluses become available. Apply to Controller of Supplies, Ministry of Works, Union House, St. Martin's-le-Grand, London, E.C. 1, and mark envelope "Section P2/A Benches."

AIR MINISTRY HYDROGEN PRODUCING PLANTS

THE Air Ministry is about to dismantle a number of these Plants, which are situated on sites leased from various Gas Undertakings throughout the country, and invites applications from potential purchasers requiring ancillary plant in the following categories:—

1. Gas Holders, Column Guided and spiral, capacity from 10,000 cu.ft. to 80,000 cu.ft.
2. Complete sets of purifiers (12 ft. by 12 ft. and 15 ft. by 15 ft.) with pre-heaters and connections.
3. B.M. and Connersville type Meters, capacity from 12,000 cu.ft./hour to 30,000 cu.ft./hour.
4. Lancashire and Vertical boilers, 80 lb. to 120 lb. p.s.i. working pressure, hand fired, capacity from 1,200 lb. steam/hour to 3,500 lb. steam/hour. With or without feed pumps.
5. Air Blowers, Hydrogen and Water Gas Exhausters, complete with driving Motor or steam engine, capacity from 12,000 cu.ft./hour to 180,000 cu.ft./hour.
6. Water Gas Plants suitable for conversion to carburetting plants complete with scrubbers. Automatic and hand operated. Capacity from 375,000 cu.ft./day to 800,000 cu.ft./day.
7. Coke filled scrubbing towers and Caustic soda scrubbing towers complete with mixing chambers.
8. Lymn Washing Towers.
9. Water cooling towers of varying capacity.
10. Water softening plants of varying capacity.
11. Water pumps of varying capacity complete with driving motor or steam engine.

Plant will be offered for sale by competitive tender and as standing erected. Facilities for inspection will be provided. Purchasers will be required to arrange for dismantling, loading and removing.

Tender forms, giving full particulars of the plant available for disposal, will be issued from time to time as Hydrogen Plants are scheduled for dismantling. Those desiring to receive Tender forms should apply by letter briefly stating their requirements to the Under Secretary of State, Air Ministry, (C.44(a)), Kingsway, London, W.C. 2.

REPAIR WORK

CLOCKWORK Controllers for Public Lighting Control and Time Switches, Clocks and all type of instruments and appliances operated by Clockwork Repaired, Overhauled and Guaranteed. Inquiries welcomed. J. W. & R. E. Hughes (Clockwork Engineers), 58, Victoria Street, London, S.W. 1. ('Phone Victoria 0134.)

STREET LIGHTING

COMPLETE Overhaul of Automatic Gas Controllers. State make and type. Quotations free on application to Geo. F. Hutchinson, M.B.H.I., 36, Lee Lane, Horsforth, near Leeds.

IRISH BOG ORE

Porous and Light
Easy to Work

A War Time Economy of Labour

HARRISONS (LONDON) LTD.

66, MARK LANE, LONDON, E.C. 3

Telegrams: "BIRCHROCK. LONDON." **Telephone: ROYal 3120**

EDUCATIONAL

THE INSTITUTE OF CHEMICAL ENGINEERS

EXAMINATION, 1946

APPLICATION forms (returnable 1st December, 1945) and particulars of the Associate-Membership Examination for 1946 may be obtained from the HON. REGISTRAR, INSTITUTION OF CHEMICAL ENGINEERS, 56, VICTORIA STREET, WESTMINSTER, LONDON, S.W. 1.

APPOINTMENTS VACANT

None of the situations advertised in these columns relates to a man between the ages of 18 *and* 50 *inclusive or a woman between the ages of* 18 *and* 40 *inclusive, unless he or she is excepted from the provisions of the Control of Engagement Order,* 1945, *or the vacancy is for employment excepted from the provisions of that Order.*

CITY OF BRADFORD

(GAS DEPARTMENT)

APPOINTMENT OF SHIFT ENGINEER

APPLICATIONS are invited for the Position of SHIFT ENGINEER at a commencing salary of £315, rising to £345 per annum, in accordance with Grade 9 of the Salaries and Grading Scheme, plus present Cost of Living Bonus, which is £59 16s. per annum.

The appointment will be subject to the provisions of the Local Government Superannuation Act, 1937, and the successful candidate will be required to pass a medical examination.

Applications should be submitted on Approved form (obtainable from the Gas Engineer and Manager, Gas Department, Britannia House, Bradford) together with *copies* of three recent Testimonials and details of previous and present appointments to the undersigned not later than November 10, 1945, in envelope endorsed "Shift Engineer."

Town Hall, Bradford. N. L. FLEMING, Town Clerk.

COUNTY BOROUGH OF SOUTHPORT GAS DEPARTMENT

APPOINTMENT OF DEPUTY GAS ENGINEER

THE Council invite applications for the Position of DEPUTY GAS ENGINEER at a commencing salary of £600 per annum, rising by annual increments of £50 to a maximum of £700 per annum, plus the appropriate cost of living bonus.

Applicants must possess gas engineering qualifications, a thorough knowledge of and experience in the control of Gas-Works Plant and Processes, and experience in the supervision and control of labour.

The appointment will be determinable by either side on one month's notice and will be subject to the provisions of the Local Government Superannuation Act, 1937. The selected candidate will be required to pass a medical examination.

Applications, stating Age, Qualifications, present appointment and duties, and full details of Experience, accompanied by *copies* of not more than three recent Testimonials, must be delivered to the undersigned endorsed "Deputy Gas Engineer" not later than Wednesday, October 24.

Canvassing, directly or indirectly, will entail disqualification.

Town Hall, Southport. R. EDGAR PERRINS, Town Clerk.

October 3, 1945.

(Classified Advertisements continued on p. 544)

APPOINTMENTS VACANT (*ctd.*)

GENERAL FOREMAN

APPLICATIONS are invited for the Position of GENERAL FOREMAN at a works in the Home Counties. Applicants should have had experience of horizontal and vertical retorts and water gas manufacture. Commencing wage £7 per week.

Apply, stating Age, Experience and position in relation to the Essential Works Order, and include *copies* of recent Testimonials, to No. 9481, "GAS JOURNAL" 11, Bolt Court, Fleet Street, E.C. 4.

CHELTENHAM AND DISTRICT GAS COMPANY

CHEMIST

APPLICATIONS are invited for the above Position at a Salary (inclusive of War Bonus) of £380 per annum. Applications addressed to the undersigned should be received not later than November 7, 1945, and should be accompanied by Testimonials.

North Street, Cheltenham. A. L. MORRIS, General Manager.

BOROUGH OF COLWYN BAY

(GAS DEPARTMENT)

DISTRIBUTION SUPERINTENDENT

APPLICATIONS are invited for the above Position at a salary of £305 per annum, plus cost of living bonus (at present £59 16s. per annum).

Applicants must possess recognized Technical Qualifications, and have had practical training in all branches of distribution work and control of labour.

The appointment will be subject to the provisions of the Local Government Superannuation Act, 1937, and the selected candidate will be required to pass a medical examination.

Applications endorsed "Distribution Superintendent," stating Age, Qualifications and Experience, together with *copies* of three recent Testimonials, should be forwarded to the undersigned not later than November 1, 1945.

Candidates should state their position in relation to the Essential Works Order.

Town Hall, Colwyn Bay. HAROLD E. BRAITHWAITE, Town Clerk.

SHEFFIELD AND DISTRICT GAS COMPANY

ASSISTANT GENERAL MANAGER

APPLICATIONS are invited from persons not more than 45 years of age for the position of ASSISTANT GENERAL MANAGER.

The salary paid will be in accordance with Qualifications and will include a War Bonus. A Superannuation Scheme is in operation to which the successful candidate would be required to contribute; a Co-Partnership Scheme is also in being.

Candidates should have had Gas-Works experience, have a sound commercial knowledge, together with experience in matters of administration.

The successful candidate will be required to pass a medical examination.

Testimonials will not be required in the first instance.

Applications should be addressed to the undersigned to reach him not later than October 31, 1945.

The Sheffield and District Gas Company, Commercial Street, Sheffield 1. RALPH HALKETT, General Manager and Chief Engineer.

October 8, 1945.

MAIDSTONE GAS COMPANY

WORKS CHEMIST

APPLICATIONS are invited for the Position of WORKS CHEMIST to the above Company. The salary offered of £300 per annum, plus War Bonus of £62 per annum.

Candidates should be able to carry out all Laboratory work attendant upon the efficient work of the Gas-Works Plant, including C.W.G. and Benzole Production.

A knowledge of the control of modern Horizontal Retort Settings would be an advantage.

Applications, stating present position, and giving details of Education, Training, and Experience, together with *copies* of two Testimonials, should be delivered to the undersigned not later than October 31, 1945.

Gas-Works, Maidstone. W. A. HOWIE, Engineer and Manager.

URBAN DISTRICT OF SPENBOROUGH

DEPUTY GAS ENGINEER AND MANAGER

APPLICATIONS are invited for the Appointment of DEPUTY GAS ENGINEER AND MANAGER at a commencing Salary of £450 per annum, rising by two annual increments of £25 to £500, plus war bonus, at present £59 16s. per annum. In determining the commencing salary, regard will be paid to qualifications and experience.

Applicants must have experience in plant maintenance and extension works and be qualified to supervise, under the direction of the Gas Engineer, all departments of the Undertaking, which has a make of 580 millions cubic feet per annum.

The appointment will be subject to the provisions of the Local Government Superannuation Act, 1937, and the successful candidate will be required to pass a medical examination.

Applications, stating Age, Qualifications, and Experience, accompanied by *copies* of three recent Testimonials, and endorsed "Deputy Gas Engineer and Manager," must be delivered to me not later than Saturday, October 27, 1945.

Town Hall, Cleckheaton. D. COUPE, Clerk of the Council.

October 6, 1945.

APPOINTMENTS VACANT (*ctd.*)

CITY OF BRADFORD

(GAS DEPARTMENT)

APPOINTMENT OF SENIOR COOKERY DEMONSTRATOR

APPLICATIONS are invited for the Position of SENIOR COOKERY DEMONSTRATOR and Home Service Organizer.

Candidates must have a good general education and hold a recognized Diploma in Domestic Subjects, and have had previous experience in conducting Lectures, Demonstrations, and organizing a Home Service Section. Knowledge of large scale cooking would be an advantage.

Salary according to scale, Grade 1 (Female) commencing at £190 per annum, rising by annual increments of £10 to £240 per annum, plus War Bonus, at present £48 2s. per annum.

The appointment will be subject to the provisions of the Local Government Superannuation Act, 1937, and the successful candidate will be required to pass a medical examination.

Applications should be submitted on Approved Form (obtainable from the Gas Engineer and Manager, Gas Department, Britannia House, Bradford), together with *copies* of recent Testimonials and details of previous and present appointments to the undersigned not later than November 10, 1945, in envelope endorsed "Senior Cookery Demonstrator."

Town Hall, Bradford. N. L. FLEMING, Town Clerk.

COUNTY BOROUGH OF DARLINGTON

(GAS DEPARTMENT)

APPOINTMENT OF DEPUTY GAS ENGINEER

APPLICATIONS are invited for the appointment of DEPUTY GAS ENGINEER. The Salary will be £625 per annum, plus Cost-of-Living Bonus, which is at present £59 16s. per annum, rising by annual increments of £25 to £700 per annum.

Applicants must be Corporate Members of the Institution of Gas Engineers, have a sound experience in the control of all Departments of a large Gas Undertaking, including Works and Distribution, with practical experience of Modern Gas Manufacture and Water Gas Plants, and be capable of preparing designs and specifications for Gas-Works Plant and Structural Work. Applicants must not be more than 40 years of age.

The appointment is subject to the Local Government Superannuation Act, 1937, and satisfactory medical examination. Canvassing, directly or indirectly, is prohibited, and will be deemed a disqualification. Candidates must state their position in relation to the Essential Works Order and National Service Act. Applications from persons serving in His Majesty's Forces will be considered if early release is anticipated.

Applications, giving full details of Age, Training, Qualifications and Experience, endorsed "Deputy Gas Engineer," together with *copies* of three Testimonials, to be delivered to the undersigned not later than November 30, 1945.

11, Houndgate, Darlington. H. HOPKINS, Town Clerk.

October 4, 1945.

BURGH OF PAISLEY

(GAS DEPARTMENT)

APPLICATIONS are invited for the Position of WORKS SUPERINTENDENT. The salary grade prescribed for the post is £350 rising to £450 per annum with placing according to qualifications and experience, plus the current war bonus of £60 per annum. The post is subject to the provisions of the Local Government Superannuation Acts, and the successful candidate will require to pass a medical examination.

Applicants should have experience of the control of vertical retorts and carburetted water gas plants; of the handling of labour; and should possess the higher grade certificate of the Institution of Gas Engineers in Gas Engineering (Manufacture), or equivalent. Applications, stating Age, Training, Experience and Qualifications, together with applicant's position in relation to Essential Works Order and the National Service Acts, and accompanied by *copies* of three recent Testimonials, should be addressed to the undersigned for receipt not later than Saturday, October 27, 1945.

The Gas-Works, Paisley, Renfrewshire SYDNEY SMITH, Engineer and Manager.

THE LIVERPOOL GAS COMPANY require the services of a PRINCIPAL CHEMIST for their Garston Works. The successful applicant will be responsible for the whole of the Works Laboratory operation, and will be required to operate under the Works Manager in liaison with the Company's skilled Laboratory administration.

Applicants should be familiar with modern vertical and horizontal retort practice and fully automatic water gas manufacture.

The salary required will be by arrangement, and not less than £500 per annum inclusive of all bonuses.

Application should be made on the official form, which may be obtained by writing to the Personnel Superintendent, Radiant House, Bold Street, Liverpool, 1, and should be returned to him not later than October 22.

EXPERIENCED GASFITTERS and SERVICE LAYERS required immediately. Rate 1s. 9½d. per hour. Opportunities for Servicemen expecting early release. Applications, giving full particulars of training and position under Essential Works Order, should be sent to General Manager, Peterborough Gas Company, New Road, Peterborough.

This advertisement is published by permission of the Ministry of Labour and National Service under the Control of Engagement Order, 1945.

APPOINTMENTS VACANT (*ctd.*)

ASSISTANT WORKS MANAGER required with drawing office and works experience of gasholder and plate construction work. Must have sound organizing ability and be a good disciplinarian. Apply, stating Age, Wages, Experience and full particulars to No. 9483, "GAS JOURNAL," 11, Bolt Court, Fleet Street, E.C. 4.

REQUIRED.—A FITTER capable of carrying out Mechanical Repairs on a small Works, and of laying mains and services. Wages 1s. 9.8d. per hour and rent-free house. Apply Secretary, Hornsea Gas Light and Coke Company, Ltd., Hornsea, E. Yorks.

COUNTY BOROUGH OF ST. HELENS

(GAS DEPARTMENT)

APPOINTMENT OF HOME SERVICE COOK-DEMONSTRATOR AND SHOWROOM ATTENDANT

APPLICATIONS are invited for the above appointment.

The Salary will be Lancashire and Cheshire Provincial Council Scale P.T.A., Grade "B" (Female), commencing on the maximum.

Maximum £236 per annum, plus War Bonus, which is at present £48 2s. per annum.

Candidates must have had a good general education and hold a recognized Diploma or equivalent qualification in Domestic Science and/or Housecraft, and should possess a thorough knowledge of Gas Domestic Appliances.

They must be experienced in conducting Lecture Demonstrations both in Showrooms and on consumer's premises, and able to advise consumers on the selection and use of gas apparatus.

Experience in organizing a Home Service Department in Canteen Work, School Feeding and the like will be an advantage.

The appointment will be subject to the provisions of the Local Government Superannuation Act, 1937, and the successful candidate will be required to pass a medical examination.

Applications, accompanied by *copies* of not more than three Testimonials, should be made to the undersigned and be received by him not later than Monday, October 29, 1945, in an envelope endorsed "Home Service."

Gas-Works, Warrington New Road, St. Helens, Lancs. R. L. GREAVES, Gas Engineer and Manager.

October 11, 1945.

CITY OF PERTH

(GAS DEPARTMENT)

APPLICATIONS are invited for the following vacancies, each of which carries a Salary Scale of £270/350 per annum, plus a War Bonus of £60 per annum. Placing on the Scale will be according to qualifications and experience.

(*a*) CHEMIST to take charge of Laboratory work and train young Staff.
(*b*) DRAUGHTSMAN to take charge of all Drawing Office work.
(*c*) A WORKS TECHNICAL ASSISTANT (junior to Superintendent and Senior Technical Assistant).
(*d*) A Chief FITTERS' INSPECTOR.
(*e*) Also at a Salary Scale of £230/260 per annum plus similar War Bonus—a FITTERS' INSPECTOR.

The position of DISTRIBUTION SUPERINTENDENT at a Salary of £400/450 per annum plus War Bonus has not yet been filled.

Applications, stating position under National Service Acts, giving full particulars of Age, Training, Experience, and Qualifications, with *copies* of recent Testimonials, should be received by the undersigned not later than November 1, 1945.

Gas-Works, Friarton, Perth. W. NICOL BAIRD, Engineer and Manager.

October 13, 1945.

THE BATH GAS COMPANY

APPLICATIONS are invited for the Position of ASSISTANT WORKS SUPERINTENDENT, with prospects of promotion.

Applicants must have had previous experience in a similar appointment.

Remuneration will be not less than £600 per annum, plus house.

Applications, stating Age, Qualifications, Experience, and particulars of present employment, together with *copies* of not more than three recent Testimonials, should be received by the undersigned not later than October 29, 1945.

18/19, Old Bond Street, Bath. CHARLES BATEMAN, General Manager.

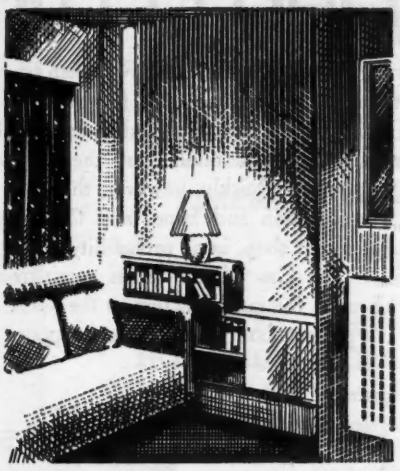
NEWTON CHAMBERS & CO., LTD., Thorncliffe Sheffield, require the services of two SENIOR DRAUGHTSMEN experienced in the preparation of drawings for gas-works plant. Applications, which will be treated in the strictest confidence, stating Age, Experience, and Salary required, should be sent to the Personnel Officer.

PATENTS

MEWBURN, ELLIS & CO.,
CHARTERED PATENT AGENTS
AND TRADE MARK AGENTS
70 & 72, Chancery Lane, London, W.C.2.
Telegrams: "Patent, London." 'Phone: Holborn 0437
And 3, St. Nicholas Buildings, Newcastle-on-Tyne.

KINGS PATENT AGENCY, LTD.
(Director, B. T. King, A.I.M.E., Patent Agent)
Advice, Handbook, and Consultations free 146a, Queen Victoria Street, London, E.C. 4. Phone: City 6161

SEEING LIFE AGAIN IN IT'S TRUE "COLOURS"



Makers of Portables, Spray Guns, Booths, Ducting Compressors, Automatics, Fans, Hose, Air Rectifiers, etc.

To-morrow's Ideal Home

Millions are eagerly awaiting the day when British Industry can once again lift the drab monotones of war from their homes. After five years of restricted domestic output, the call will be for gay, clean, refreshing COLOUR.

To those planning to present their products to a waiting world (and who isn't!) Aeraspray offer their system of Industrial Spraying with all equipment and full co-operation. Aeraspray advising technicians are at your service at all times. *Contact us to-day.*

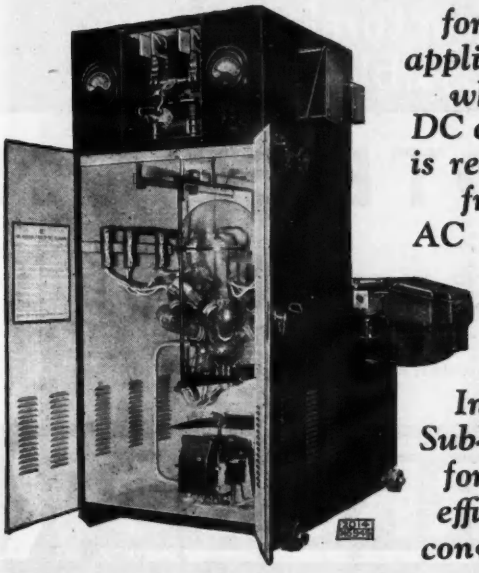
AERASPRAY

SYSTEM OF INDUSTRIAL SPRAY FINISHING

AERASPRAY MANUFACTURING CO. LTD., 1 VICTORIA ST., LONDON, S.W.1
179-213 THIMBLE MILL LANE, BIRMINGHAM, 7. Also at MANCHESTER, BELFAST, ETC.

545

Mercury-Arc Rectifiers

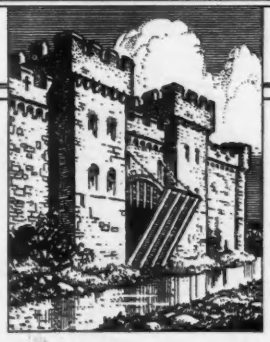


for all applications where DC current is required from AC supply

Indoor Sub-station for high efficiency conversion

Completely self-contained, with AC and DC circuit-breakers, meters and control gear. Automatic voltage control to maintain voltage at pre-set figure for all loads

The **ELECTRIC CONSTRUCTION Co.** Ltd.
WOLVERHAMPTON



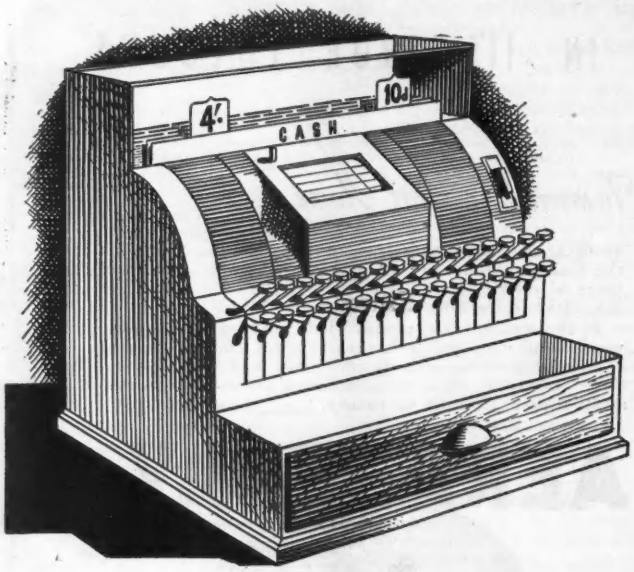
PROTECTION

GAUNTLET

GAUNTLET

WEATHER TESTED PAINTS

ARCHD H. HAMILTON & CO. LTD
27-37 BARDOWIE STREET POSSILPARK GLASGOW N



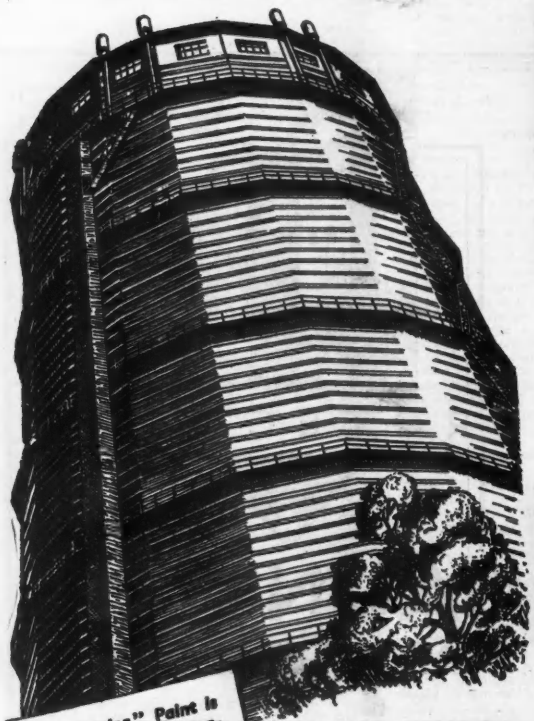
PROTECTION..

THE CASH REGISTER, when it was first introduced as a replacement for the old-fashioned "Drawer Till," was frowned upon by the retail fraternity as "just another of them new-fangled contraptions." Quickly, however, the Cash Register won recognition and fame, and to-day, even the village corner shop, in all probability, is not without one. The Gas Meter—in its specialized field—fulfils much the same function as the Cash Register . . . it protects both consumer and supplier . . . but just as there are Cash Registers and *Cash Registers*, so there are Gas Meters and GAS METERS.

your *protection* is the

"A&M" METER

ALDER & MACKAY LTD., NEW GRANGE WORKS, EDINBURGH, 11



Give GASHOLDERS and other steel structural work the best possible

PROTECTION

Owing to its exceptional rust-inhibiting properties, "Ferrodor" Metal Protection affords great economy in labour and reduces maintenance costs to the minimum

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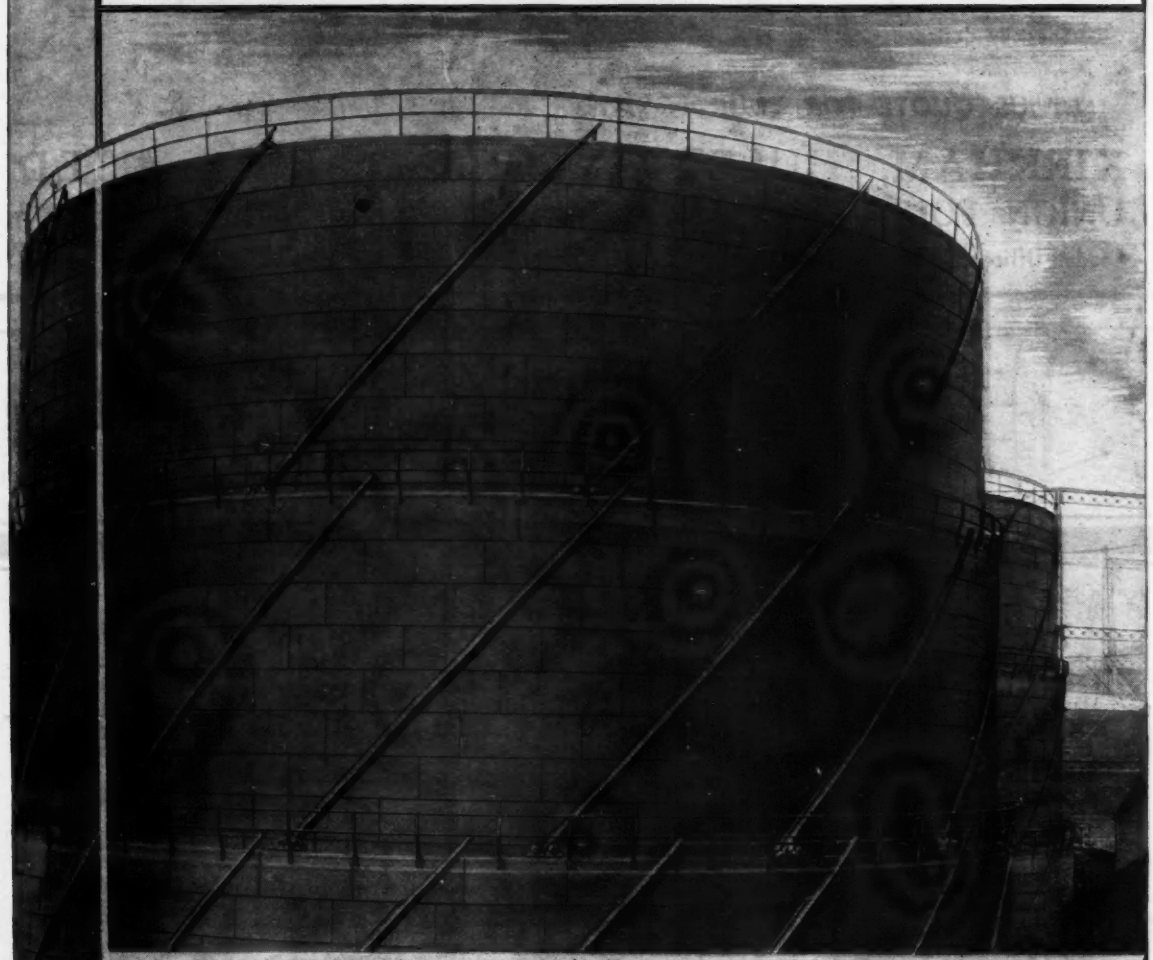

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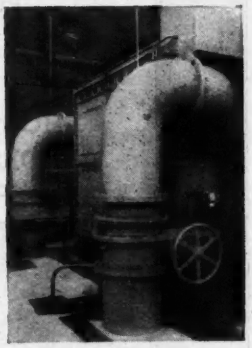

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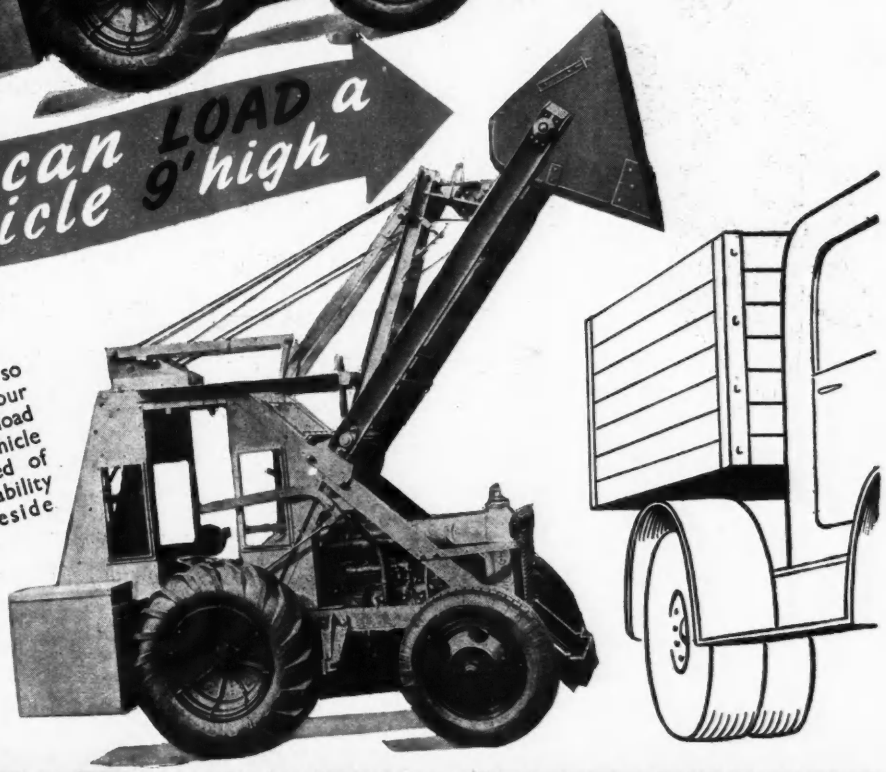

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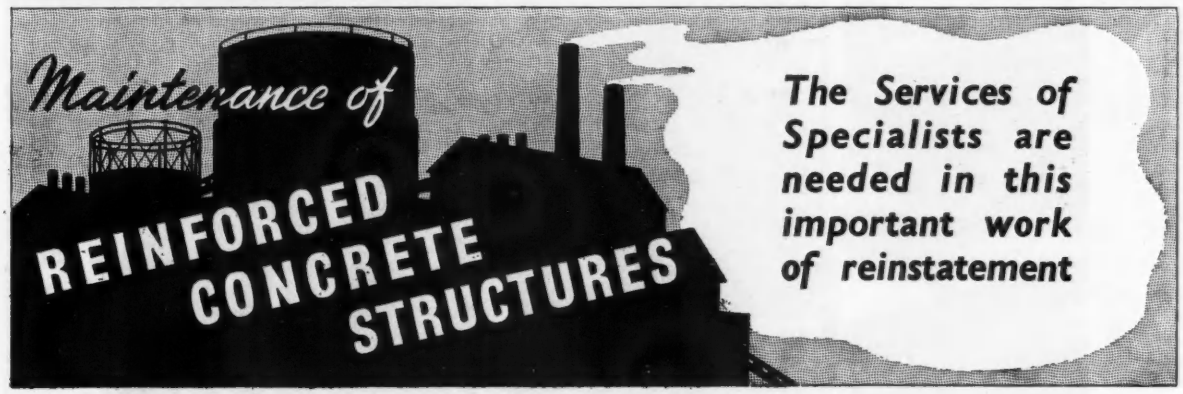
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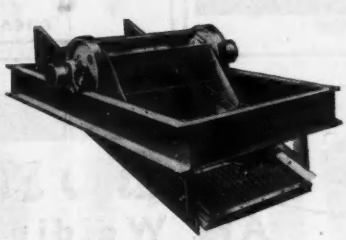

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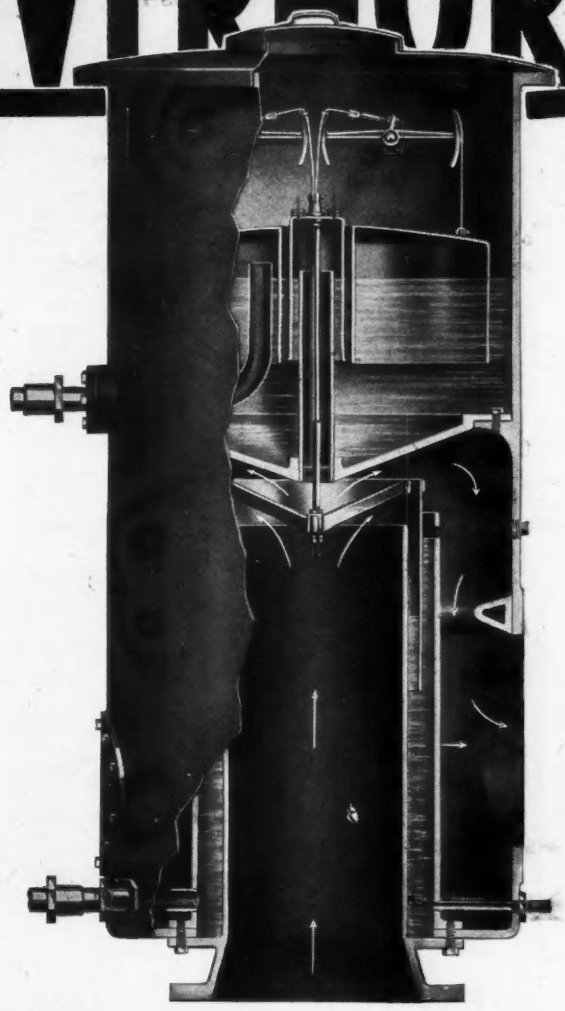

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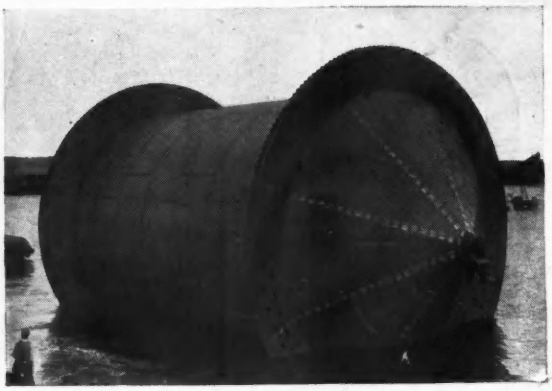

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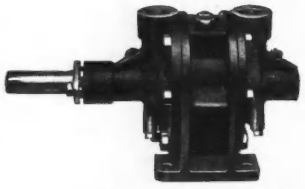

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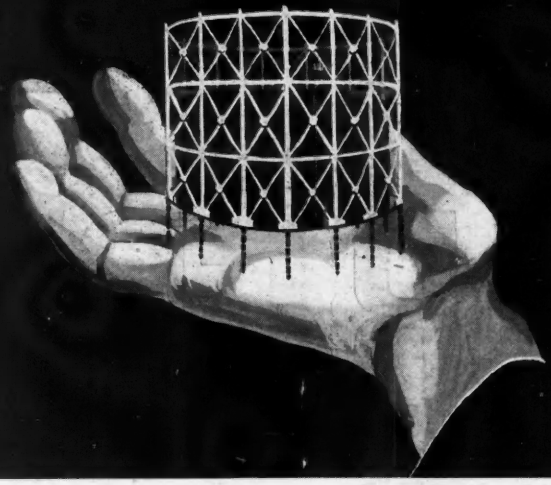

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